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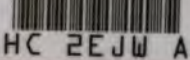
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BY PROFESSORS AND LECTURERS IN THE LEADING
MEDICAL COLLEGES OF THE UNITED STATES,
GERMANY, AUSTRIA, FRANCE, GREAT
BRITAIN, AND CANADA.

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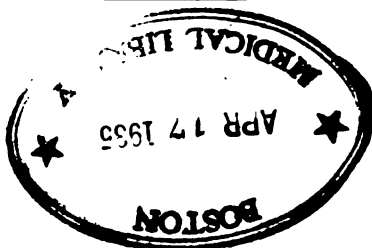
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Treatment.

JACKETS IN SPINAL DISEASES; THEIR HISTORY, USES, AND DEFECTS; THE TWO MECHANICAL PRINCIPLES UNDERLYING THEIR ACTION.

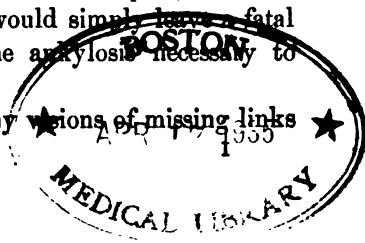
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THE earliest use of jackets in spinal diseases appears to have been purely empirical and domestic, and not at all professional. Centuries ago high-born ladies propped up their waists with "bodices," which at a later period were called "stays," but now bear the old French name "corsets." We find at the present time a considerable number of women in the early stages of Pott's disease who are totally unaware of the nature of their malady, and have never had professional advice for it, but who have learned from personal experience that they are greatly relieved and benefited by buying unusually stiff corsets, and firmly lacing them on. From my observation of these patients, I think many mild cases are thus cured without the help of a surgeon, and that hundreds or thousands have thus been restored to health during the long period since womankind first invented "bodices."

This hint from domestic practice does not seem to have been heeded by surgeons until about eighty years ago. Pott himself, who wrote the first good description of the disease bearing his name, opposed all mechanical supports, trusting to rest and counter-irritation by issues. The best English surgeons were of the same opinion, claiming that, as the disease destroyed one or more vertebræ, it was necessary to allow the adjacent ones to fall together and fill the vacant space, and that any spinal supporter which prevented this would simply leave a fatal gap in the spinal column, and prevent the ankylosis necessary to recovery.

Meanwhile, the women, untroubled by any



in their backbones, continued to cure themselves in hundreds by the simple process of making stiffer bodices, and lacing them tighter around their waists.

About 1815, Le Vacher, of Paris, seems to have taken a hint from the ladies. He constructed a strong corset, and, having strengthened it with steel and attached a jury-mast and a head-stretch, employed it with great advantage on his patients. The fall of Napoleon and the consequent return of peace occurred about this time, and with the freer flow of international intercourse Le Vacher's improvement seems to have spread to England. The British surgeons called the instruments "stays," and to help support their weight they added jointed sheet-iron splints extending down the legs to the shoes.

In 1824, Gibson, of Philadelphia, recommended Le Vacher's jacket to the American profession.

About the same time the German surgeons got hold of the principle, and Schmidt, Langenbeck, Von Graefe, and others constructed various stays or jackets.

Notwithstanding Gibson's advice, the American surgeons held back for some years, under the influence of the English opposition to all mechanical supports. The elder Gross, however, devised a kind of half-jacket, in which a leather armor, strengthened with steel, surrounded and capped over the hips, and supported a padded steel frame surrounding and supporting the waist and shoulders.

After some years the Americans got over the fear of producing a gap, or a missing link, in the backbone, and invented jackets in such numbers and varieties that I am unable to state the order of their appearance or the names of more than a few of those devising them. I will first mention some of the chief varieties, and afterwards discuss the qualities of the material employed, and the mechanical principles involved.

One of them was a curious device of Dr. Wood, of Boston, who afterwards removed to New York. So far as I know, he was the first to point out the mechanical principle that where the waist is smaller than the hips a corset possesses an actual lifting power on the portion of the trunk above the smallest part of the waist. I will demonstrate this problem farther on. Wood, strangely enough, adopted the idea that while the lifting or extension power of the jacket was desirable, the immobilizing effect was objectionable. He therefore devised a plan to make his jacket flexible in all directions. It was made of cloth, and the sheaths usually filled with whalebone were occupied by flat strips of steel wire bent in a serpentine form, as in Fig. 1.

Now, flat whalebone strips bend flatwise, but not edgewise; hence, in corsets, they tend to prevent motion, and give the apparatus a certain degree of inflexibility when snugly laced on the body, but Wood's steel wire springs bent in all directions alike. The profession, of course, did not want a jacket for spondylitis which was expressly made to allow motion, and the invention fell into disuse for that disease, yet the actual amount of motion was limited, and I have seen patients cured by the apparatus. It is still used for lateral curvatures.

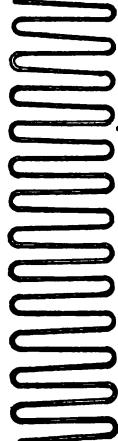
Professor Lewis A. Sayre expended much talent and ingenuity in devising jackets of mingled plaster of Paris and cloth, which were light enough to be tolerated by the patient and absolutely inflexible. He succeeded in overcoming the difficulties of the materials to such an extent that they have been very extensively used, and have conferred this important boon on the public: in the remotest valleys or mountains of the great West, any practitioner, who understands the method, though he be a thousand miles from any instrument-maker, can with a little care fit out his patient with a series of plaster jackets, renewing them once a month, until he recovers.

Professor Sayre, in mild or convalescent cases, made the jacket a little thinner than ordinary, cut it open in front, applied leather strips with eyelets and hooks, and is able to take it off at will, for bathing, and to reapply it.

Several surgeons, in this country and in France, devised jackets of different sorts of felt. Some of them did good work for awhile, but the material proved too weak for durability, and they fell out of use.

About the year 1865 I made an extension jacket of this sort. A hip armor (*H*, Fig. 3) was hammered out of sheet brass to fit a cast of the patient's hips. The armor was made in three pieces, hinged together near *H* on each side, and clasped in front. From the centre of the hip armor in back and front rose two steel rods terminating at the top in screws, and carrying nuts. A steel ring (*R*) surrounded the neck, and was provided with holes which received the tops of the steel rods. The ring rested on the nuts, by which it could be raised or lowered. A jacket (*S S*) of russet bridle-leather, padded under the arms, surrounded the chest, and was laced in front. The upper edge was attached to the neck-ring. By turning the nuts the ring and jacket were raised and extension made. In the illustration the nut is by mistake placed on the top of the ring. This brace did good cura-

FIG. 1.

Serpentine
steel wire in
Wood's corset.

tive work, but it was expensive and difficult of construction, so that I discontinued its use.

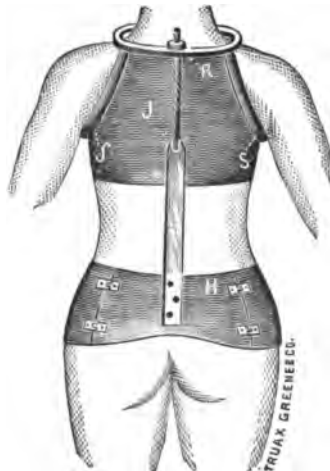
More recently, Dr. Roberts has devised a traction jacket on a similar

FIG. 2.



Sayre's open plaster jacket.

FIG. 3.

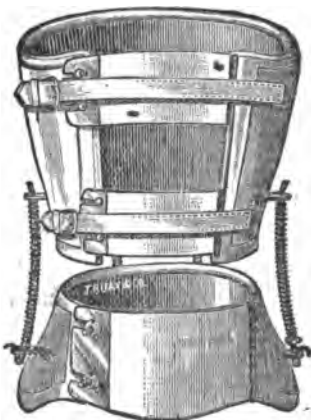


Andrews's lifting jacket.

principle, but his supporting rods go up on each side, instead of back and front.

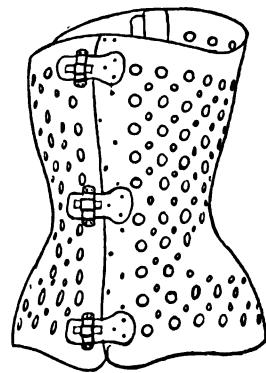
Dr. A. M. Phelps, of New York, has made jackets of perforated

FIG. 4.



Roberts's segment brace.

FIG. 5.



Phelps's aluminum jacket.

aluminum. They are hinged in the back and clasped in front. Their merits are strength, lightness, and neatness.

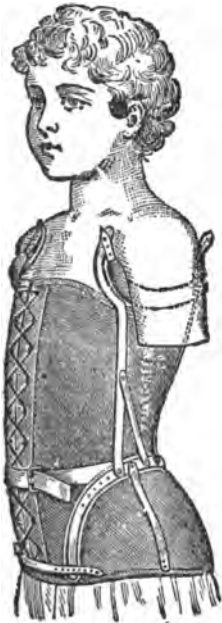
Dr. Beely, of Berlin, is fond of jackets of strong cloth, stiffened with steel.

Leather has been used by many surgeons, and in many forms. The usual plan is to make a plaster cast of the patient's trunk, and taking russet bridle-leather, or thin sole-leather, soften it thoroughly in warm water, and crimp it upon the cast by winding a strong cord or flat webbing over its entire surface, and in that state drying it. The instrument-maker, Gemrig, of Philadelphia, prefers half-tanned leather, on account of its superior firmness.

All leather, however firm it may seem at first, slowly yields to the pressure and dampness of the body ; hence it is necessary to strengthen it with strips of steel or other metal.

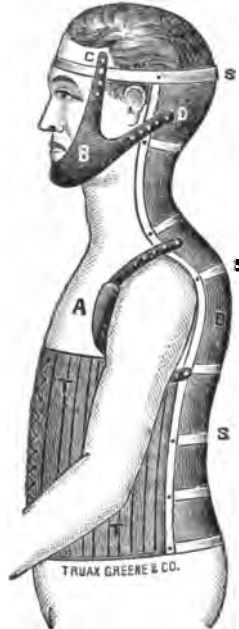
Lannelonge, of Paris, makes a corset on this plan, which has been

FIG. 6.



Beely's cloth and steel jacket.

FIG. 7.



Andrews's leather, cloth, steel, and whalebone jacket with head-stretching attachment.

much used, and I have constructed many on that principle, but different in form.

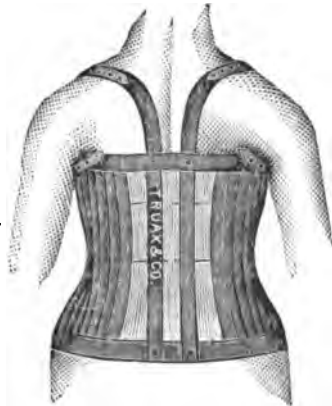
Professor Joseph Eastman, of Indianapolis, makes an excellent leather jacket, without the help of steel, by binding on a cast of the

body wet leather of sufficient thickness, so that, when dry, it is very firm, and will last a considerable time without losing its shape.

Many years ago I first constructed the jacket shown in Fig. 7. I take a plaster cast of the back, with the spine a little flexed backward, and mould thick wet leather upon the cast. When this is dry, openings are cut along the spine, strips of steel are bent and riveted on to strengthen the leather, and a lining of chamois-skin or buckskin put in. The front is completed as a cloth corset filled with whalebone. If the head-piece is needed, the leather and steel are carried up as in the cut, and the leather chin-piece (*B C D*) is applied to make extension on the neck.

Where the disease is below the level of the axilla I prefer the following plan: A steel frame is fitted to the back with the two upright

FIG. 8.



Andrews's cloth, whalebone, and steel jacket.

strips curving outward at the top till they reach the level of the shoulders. A wide pad or cushion is attached to the front of the uprights on each side of the deformity. A cross strip is riveted on at the level of the axilla and another at the bottom of the brace. Attached to this steel frame is a cloth corset gored to fit the form, and lacing in front. It is as full of whalebone as the cloth will hold. This brace is lighter and cooler than a leather one, and can be made in a moment as tight or as loose as the patient's varying condition demands. If the deformity is low down, groin straps, like those of Ridlon and Taylor, are added; if high up, a head-stretch is put on.

Many years ago Professor Yandell, of Louisville, used to make a very light and firm jacket as follows: On a cast of the trunk he wound alternate layers of cotton bandage and manilla paper dipped in glue. When they were a quarter of an inch thick he dried them, cut out a strip in front, applied eyelet-hooks, bound the edges, and laced the dressing upon the patient. These jackets could be taken off and reapplied at pleasure. They lasted about six months, and did very good service.

Dr. Louis A. Weigel, of Rochester, N. Y., has made a jacket in a similar way, of alternate layers of linen and wood-pulp matrix-paper, applied with bookbinder's paste. When dry it is finished with eyelet-hooks, etc., and covered with enamel paint. It is ventilated by numerous perforations a quarter of an inch in diameter. The enamel paint

increases the durability by preventing the perspiration from penetrating it.

Waltuch, of Germany, has made a similar jacket by pasting upon the cast layers of thin shavings of wood. Professor J. Ridlon, of Chicago, uses a brace, modified from that of Taylor. It consists of a padded steel frame on the back with shoulder-straps, and converted into a jacket by a cloth "apron" stiffened with whalebone in front. When the disease is very low down, he increases the leverage of the lower end by straps passing around the tops of the thighs.

The main mechanical principles of all the innumerable orthopædic jackets are two in number. They are the splint and the lift principles.

The splint principle is as plain as day. The jacket encloses the body in a tube of strong material which makes resistance against flexion of the spine in any direction, and secures a more or less complete immobility of the diseased vertebræ, thus giving them a mechanical rest, which often results in permanent recovery. Another advantage is also secured by flexing the patient's spine backward when the plaster cast is taken, or by the insertion of pads each side the deformity; if a steel frame is added, the jacket flexes the spine backward when it is worn. This throws the weight to be borne on the articular processes, which are healthy and are farther back than the diseased parts. The articular processes thus become fulcræ for prying the diseased bodies a little asunder, and relieving them of injurious pressure.

In young children the hips are smaller than the abdomen, so that they furnish no foundation for a lifting apparatus. Jackets in them are nothing but splints, except when the head-stretch is added.

The lifting principle of the corset comes in play most powerfully where the hips are much wider than the waist, as in the adult woman.

As I said before, Dr. Wood was the first to state this principle clearly. As it is not obvious at first to every one's mind, I will explain by help of a diagram.

Let $EFGH$ be the lateral outlines of a woman's waist reduced to straight lines, with exaggerated slopes, for the sake of illustration. In the same way let $GHIJ$ be the slope of the hips. Now let a corset

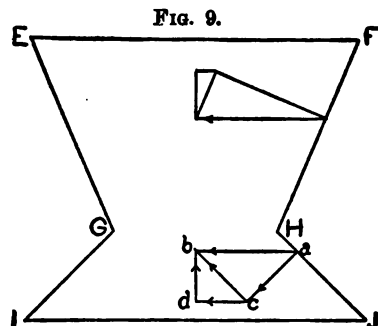


Diagram illustrating the lifting power of the corset.

be applied to this double cone and laced up so as to make a decided pressure on all the surfaces. It is obvious that the upper part of the corset, $EFGH$, cannot slide up on the body, being smallest below, so that any force applied upward will tend to lift the body with it, and to make extension on the spinal column or to relieve it of pressure.

Now, if the lower part of the corset, $GHIJ$, is firmly laced, the pressure will tend to make it slide upward along the slopes of the hips $IGJH$, lifting the upper part of the corset with it and the patient's waist enclosed in it. This may be shown graphically by means of the above diagram. Let the line ab represent in magnitude and direction the horizontal force acting on the slope HJ , due to the tension of the corset strings. To ascertain the force tending to slide the corset up the slope (HJ) we will resolve the force ab into two components, cb and ac , respectively parallel and perpendicular to the line HJ . The line cb represents the component of the force ab , tending to slide the corset up the slope HJ . To find the lifting power exerted on the upper segment of the corset we now resolve the force cb into two components, db and cd , respectively vertical and horizontal. The vertical component db represents that portion of the original force ab which tends to lift the upper section of the corset.

In this discussion the friction has been neglected, but the movement of the body upward in its clothing is so exceedingly slow that the resistance caused by the friction practically amounts to nothing.

The male form is not equal to the female for corset-lifting purposes because the hip slope is less extensive, but it is nevertheless capable of receiving considerable elevating force, and the lifting power of corsets is applicable to adults of both sexes.

The materials of corsets have their several advantages and defects.

Cloth is light, cool, and easy to put into shape. It wears out more rapidly than leather, and requires occasional repairs. It can be had in all places, and be put into shape by all who can sew. It requires the strengthening power of steel and whalebone, but braces of these materials can be made under the eye of the doctor wherever sewing women exist and such mechanics as gunsmiths or lock-and-key makers live. Indeed, very useful corsets can be made of cloth and whalebone alone, if the deformity is below the axilla.

Leather is far more durable than cloth, and if ventilated by quarter-inch perforations can be made passably cool. It requires, however, the help of a mechanic of some sort to apply the steel strips, though the country surgeon can do it if he have a few tools and materials.

Paper is less durable than leather, but is similar to it in most other qualities. Perforated aluminum requires skilled instrument-makers, but is reasonably light, and very strong, durable, and elegant.

All the corsets just described can be taken off and put on at will, for baths, etc., which is an important matter.

Plaster-of-Paris jackets have some peculiar advantages. They can be applied anywhere without any help from instrument-makers, if the local practitioner knows how to do it, and the materials are very cheap, so that poor patients can afford them.

The plaster jackets are also very strong and perfectly inflexible, effecting a high degree of immobilization of the spine.

Originally they were made continuous all around the patient's body, and could not be removed without destroying the apparatus, but now many are made to open in front and lace up like other jackets. At first they generally extended only up to the armpits and were of little use for spondylitis above that level, unless the inconvenient jury-mast was added. At present they are sometimes carried up the neck and enclose part of the head if the disease is high up.

The question naturally arises, how any corset-lifting power can be gotten out of plaster of Paris when applied as a solid irremovable box, since it cannot be laced up any tighter. It is to be remembered that when the plaster jacket is applied the patient is usually suspended. Experiments and measurements show that under suspension the intervertebral cartilages elongate very perceptibly, and the ribs are pulled up and the pelvis tilted down. When, therefore, the plaster jacket is hardened and the patient stands again on the feet, if he or she is an adult, the waist is held up in the upper cone, and transmits the weight down through the plaster upon the cone of the hips, tending to keep the spinal column stretched between until the pressure atrophies the encased soft tissues and gives the body room to slide down inside the jacket.

The objections to the plaster jacket are these.

First, it is rather heavy.

Secondly, if made in the form of a solid box, incapable of being opened temporarily for bathing purposes, it must be renewed every two or three weeks, or else the perspiration undergoes putrefaction and the patient's skin gets into a very foul and offensive condition. Some who have worn it too long are found in a frightfully filthy state. As they cannot put it off and on themselves, it is not possible to use it on patients living at a distance from any physician who understands how to apply it. In jackets so made that they can be opened and

laced up this great evil is obviated, but they are weak, are liable to crack, and lose their stiffness rather more rapidly than is desirable, so that they are not nearly as durable as jackets of tougher materials.

Thirdly, when the patient is emaciated, it is difficult to apply the jacket so as to avoid making ulcers where the hard plaster presses on subcutaneous points of bone. Care can mitigate this evil, but emaciated patients who have not been kept under careful observation sometimes present themselves in a pitiable condition from these ulcers.

From these and other objections I find myself, in common with many other surgeons, using the plaster jacket less than formerly, and preferring other materials, but I think it still has a great field of usefulness in selected patients and in those who live far away from large towns.

ORTHOPÆDIC SUGGESTIONS FOR THE USE OF THE GENERAL PRACTITIONER.

BY REGINALD H. SAYRE, M.D.,

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ANDRY, when he wrote his "Orthopædia," in 1743, called it "the art of correcting and preventing deformities in children." If more attention were paid to the prevention of deformities in children at the present time, the greater part of the work of the orthopædic surgeon would be unnecessary. Most of his time is now occupied in the correction of deformities which should never have been allowed to occur, and whose existence is only traceable to the lack of proper knowledge on the part of the profession at large as to the means of diagnosis and modes of prevention of the deformities following inflammation of joints, infantile paralysis, and malnutrition. It is an every-day occurrence for parents to bring a child with a hideous lateral curvature, and tell you that they noticed years before that the child was not perfectly straight, but on being informed by the family physician that the child would "grow out of it," they paid no further attention to the matter until an increasing curve forced itself so vigorously upon their notice that they were obliged to seek aid. In the same way many cases of club-foot are brought, with the history that the family doctor advised that no treatment should be begun until the child was "old enough to stand it," the impression apparently being that the treatment for the relief of this deformity must be so severe as to be unendurable for a small child. Again, cases of hip-joint disease come before you with the leg drawn up until the patient has much the attitude of a crane standing on one foot, where it is said that "the doctor has been suspecting hip-joint disease for some time," and now that it has "developed" itself, sends the patient for treatment. The old adage, that an ounce of prevention is worth a pound of cure, is nowhere more plainly exemplified than in orthopædic surgery, and many of the brilliant results obtained in cases seen in the beginning would have been impossible had the case been allowed to take its own course for a few months longer.

What should the general practitioner do, for instance, with a case of congenital club-foot? Instead of telling the parents to wait until the child is old enough for operation, he should at once proceed to manipulate the feet towards the normal position, and give instructions to the nurse how to repeat these manœuvres many times during the day, and if this course is intelligently and faithfully carried out, the improvement that will be gained in a fortnight's time will very much surpass that which an equal number of weeks could produce six months later. As soon as there is a reasonable degree of firmness in the baby's skin, the foot should be retained in the improved position by a nicely-fitting flannel bandage applied next to the skin, and a very light shell of plaster-of-Paris bandage outside of this, the whole being removed at intervals of a week to bathe the child's foot, manipulate the leg, and still further improve the position of the foot. In cases where the inversion is very obstinate, and the child has a tendency to kick the bandages off, it is often a great aid to apply the plaster of Paris from the toes to the groin while the knee is bent at right angles and the foot everted, as this serves to retain the dressing in position very much better than when applied simply to the knee or applied to the thigh while the knee and leg are straight. In the case of small babies, this dressing has, in my hands, shown itself infinitely superior to any adjustable shoe bought at the instrument-makers, for it is impossible to keep the latter on the feet of small babies who are constantly kicking and squirming and rubbing their feet against each other. If instituted early, this treatment will almost always bring the feet to a practically normal position by the time the child is old enough to stand upon his feet and walk; treatment, however, should not be discontinued until the child can voluntarily hold his foot in a normal position, and the rectification by means of manipulation and plaster boots should be supplemented by massage and electricity until the normal tone is restored to the nerves and muscles of the foot and leg.

In rickety children with bandy-legs, knock-knees, lateral curvatures or arched spines, the proper recognition of the condition and prompt treatment will often save the child from becoming a hideous little cripple. Bandy-legs and knock-knees can very easily be straightened in the early stages by enclosing the legs in plaster-of-Paris bandages applied outside of a flannel roller, and bending them straight just as the plaster sets; and in cases where the deformity cannot be completely rectified in this manner, further straightening can be effected by cutting completely through the plaster shell at the point of greatest curvature, removing a wedge from the convex side, straightening

the leg, and inserting a wedge of wood in the opening thus formed on the concave side of the plaster, and retaining the leg in this improved position by means of another roll of plaster-of-Paris bandage applied around the crack. In cases of rickety curvatures of the spine in infants, either lateral or antero-posterior, no treatment is so good as putting the child upon a padded board, after the fashion of an Indian papoose. In many cases, in addition to strapping the child to the board, a head-rest should be added to support the weight of the over-developed head, which sways around on the thin little neck like a squash on its stem. Of course, the child's diet should be regulated, as an essential in the treatment; milk, pasteurized, or else modified to represent more nearly human milk by the addition of cream and lime-water, in proper quantities, is vastly better for these children than the manufactured baby foods, the pictorial advertisements of many of which, while very pleasing to the eyes of the average mother, show to the intelligent physician a collection of big-headed, knock-kneed, bandy-legged, soft rickety babies, who are big and soft and bruise easily. In my experience, one of the best tonics for these rickety children is phosphorus, and I prefer to give it in the form of the elixir of phosphorus of the "National Formulary," a teaspoonful of which represents a fiftieth of a grain of phosphorus, and this amount three times a day I find well tolerated in children ten months to a year old. The administration of it, however, should not be continued more than a month at a time, the phosphorus then being omitted for two or three weeks, and again resumed. I find that under its use large fontanelles begin to close up, and that teeth, tardy in their development, begin to appear.

After diphtheria and after infantile paralysis, we often find children standing on one foot and favoring one side of the body, one shoulder projecting and one hip more prominent than the other. When a parent brings you a child of this sort, never put her off with the tale that the child will "grow out of it," or is lazy and does not care to stand up straight. Strip the child and look it over carefully, or if you have not time to do that, send the case to somebody who will. If there is any deviation from the normal when the child bends forward and lets both hands hang towards the floor, and if the ribs on one side are a trifle more prominent than on the other, rest assured that months and perhaps years of patient trial are before the mother of that child if she expects it to grow to manhood or womanhood with a straight, symmetrical form.

These cases require careful physical culture, not merely advice to the mother to have the child exercise. Unless you explain to her how

the child should exercise, and are competent to give these exercises, you will do it no good, and might as well expect it to learn to play upon the piano without receiving instruction. Do not send the child to an instrument-maker to have a brace applied because you are ignorant of what to do for it. The instrument-maker is as ignorant as you are, and the child will receive no benefit. Either familiarize yourself thoroughly with the present state of the treatment of lateral curvature, and be prepared to treat the child intelligently for months, or else send it to some one who can treat it before it has become crooked. After the ribs have become bulging and prominent no one can push them back to their proper position.

When a parent brings a child with a history of aches and pains in the chest, the stomach, or the knee, do not say "it has growing pains" or "neuralgia," or, "it does not want to go to school," but take its clothes off and examine it very thoroughly to see if these fugitive pains, of which it complains, are not the result of a beginning osteitis in some part of its body. See if the temperature is not elevated half a degree or so. Let it take its own time to assume a position of comfort, which very likely it does not assume when you first examine it because it feels strange. If there is disease of a joint there will be spasm of the muscles controlling the motions of that joint, whether it be the ankle, the knee, the hip, the spine, or any other joint of the body. If you find limitation of motion, you may not find pain on motion, because Nature prevents your moving the joint sufficiently far to cause pain unless you make very violent efforts; the absence of pain, therefore, does not always mean the absence of disease. But if a child complains of reflex pain in the part of the body where is found the distal extremity of the nerve which supplies a stiffened joint, be carefully on the watch for an inflammatory process in that joint. If you find atrophy of one leg, slight limitation of movement in any of the joints in that leg, and a pain either at the point where motion is restricted or lower down in the limb, be pretty sure that you have an inflamed area in the bone in the neighborhood of that joint, and try to follow out the indications which Nature has pointed out,—namely, to give the part rest. The muscular spasm is present for the purpose of affording rest to the joint, and the more absolute the rest which you give it, the sooner will Nature be enabled to repair damages. It is surprising how much damage Nature can repair, if man does not interfere with her designs. If you find a child with an inflamed hip-joint, do not let it alone until you can send to some distant town to get this, that, or the other hip-splint, but put it to bed and keep it quiet; put its leg in the position

which will give the greatest freedom from pain, and keep it in that position by the best means at your disposal, whether it be a weight and pulley, a plaster-of-Paris bandage, or a splint and ordinary bandage, using whatever means you can employ most quickly, and put the leg at rest so that the child will sleep quietly at night and be free from pain ; and, if any be present, rectify the deformity little by little, rather than endeavor to force the limb immediately to a straight position. If the disease be in the back, by all means take the child off its feet and put it quietly at rest in bed ; let it stay there until you find a convenient time to apply a plaster-of-Paris jacket to support the body. If you find after you have applied a jacket that the pains still continue, that the appetite is poor, that the general health is suffering, put the child to bed and remove its jacket, and keep it quiet by other means ; give its spine a chance to get well instead of urging the child to go about with the anticipation that it will get strong because it is out of bed. There is a prevalent idea among people throughout the country, which was put in their heads by ignorant doctors ages ago, that people grow weak because they stay in bed, whereas, the fact usually is that people stay in bed because they are too weak, or have too much pain, to stay anywhere else, and if they had gone to bed earlier, the duration of their stay there would have been very much curtailed.

If the point of disease is in the upper dorsal or cervical region, do not put on a jacket unless you add to it a jury-mast to support the weight of the head and shoulders. Remember the principle of rest and removal of traumatism that you are trying to carry out, and do not apply a plaster jacket up to the point of disease, and allow the patient to walk about without support for the upper part of the body, as the jacket then serves no useful purpose as a support and is simply an additional weight for the damaged spine to carry.

The points which I wish to emphasize in this paper are, that it is in the power of the general practitioner to aid the orthopædic surgeon immensely by the prompt recognition of deformities and diseases at their commencement, and either equip himself, by study and practice, to treat them intelligently, or else refer them to those who can so treat them at once, rather than later on, when the diseases have progressed and the deformities become more marked. In inflammation of bone, rest, especially in the early stages, is the important factor in securing a good result ; and in the application of splints or dressings of any kind, the injunction of the painter who, when asked how he mixed his colors, said that he mixed them with brains, is to be strictly followed if good results are to be obtained.

THE NUTRITION OF CHILDHOOD.

BY EDWARD P. DAVIS, A.M., M.D.,

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THE stress so commonly laid upon the choice and preparation of food for children tends to the neglect of other factors not less important for the proper nutrition of childhood. It is not uncommon to meet with cases in which the food of the child is theoretically correct, but in which a neglect to secure the conditions necessary for assimilation defeats the best efforts of the physician. Each child furnishes an individual study requiring careful observation. It is only by treating children from the stand-point of individual peculiarity that the problem of the nutrition of childhood can be solved. Only those who so proceed to study their cases appreciate the complexity and difficulty which these patients occasion.

The selection of food for young children has been simplified by chemical study to such an extent that the average child can readily secure its proper food. The partial digestion of cow's milk and cream combined with the process of pasteurization furnishes a food, chemically and physiologically, closely resembling mother's milk. The digestive ferments are so readily obtained and in so pure a condition that the material for such a preparation of milk is readily at hand. Experience has shown that prolonged sterilization does not furnish a nutritious and easily digestible food, but that simple scalding is quite sufficient to avoid the common varieties of poisonous germs, and without impairing the nutritious qualities of cow's milk. No special apparatus is needed for this purpose, and the problem of the preparation of milk is rendered simple enough for the ordinary housewife. Experience has shown that improvements in dairy farming are of vital importance in securing proper milk, and that the supply from a good herd, properly taken and brought without contamination to the consumer, is often all that is necessary.

For children with whom milk does not agree, meat-juice, broths, and vegetable albumen are readily obtainable. For those who require additional fat, olive oil often replaces cod-liver oil with equal advantage and much greater convenience.

When the selection of food has been judiciously made, only the first step in the problem has been solved. The next inquiry may naturally be as to the amount which the child can take, and the intervals of feeding: here it is necessary to ascertain the child's appetite. In many cases this is curiously modified by direct inheritance; thus children whose parents have taken but little food comparatively often manifest the same peculiarity; others are proverbial overeaters, and even in infancy take more than they can digest. Hereditary peculiarities of the nervous system influence the child's appetite to a very great degree. The placid infant will take its regular food at regular intervals with but slight variation, while the nervous child, if fatigued, can eat but little, while at other times it may be ravenously hungry. Appetite should be a rational index of power of assimilation, and if the infant be studied in its peculiarities, he may be trained in habits which shall in a large measure correct his own inherited tendencies. Where children manifest a remarkable lack of appetite, it will often be found that a disordered condition of the digestive tract is the cause. When such is not present, the child should be allowed to become thoroughly hungry, given appropriate food, the intervals lessened, and the amount increased until it receives all which it can assimilate. It must be remembered that badly nourished children often have no appetite because of their debility, and that tonics and systematic feeding will often renew an appetite when nothing else will accomplish this result.

A child's appetite also furnishes the safest clinical index for the increase of its food; beginning with the minimum amount which a child of its weight and age should have, and having established a favorable condition of the digestive tract and regular times of feeding, a child's appetite may then be studied for indications demanding increase in the amount of food. If the premises already described be properly secured, there will usually be no trouble in arriving at reliable indications for an increase in the amount of food taken.

A point of importance in the successful nourishing of the child is to be found in the fact that variety in the child's food is demanded for successful nutrition. The indications for variation in diet are to be found in the establishment of new functions which enable the child to increase its range of digestion. The establishment of the salivary

secretion and the cutting of teeth mark the time when the child may add solid food to its diet. Soft bread and butter, very light and tender meat, or soft-boiled eggs are acceptable and beneficial at this time. Robust children seem to crave variation in food before this period, and while the gums are swollen with the cutting teeth a healthy child will often suck a small chicken-bone or chop-bone with great delight.

The common practice of the sterilization of milk has brought to notice interesting cases which emphasize the necessity for giving children fruit-juices and vegetable food. Cases of scurvy occurring in children fed exclusively upon sterilized milk have drawn our attention anew to the value of orange-juice and vegetable soup stock in children's diet. While the albumen of fresh meat is of great advantage in these cases, it is also of value to give the child broths whose stock contains the extractive matters from potato, parsley, onion, celery, turnips, and sometimes carrots. In summer, soups made with fresh corn or from fresh peas furnish a very agreeable and beneficial form of food. Children often do badly because those who have charge of them fail to appreciate the fact that they require change of diet at various seasons of the year, and at the different stages of their development.

A child's food may be properly selected and prepared, given in proper quantities and at the right time, and still nutrition may be poorly carried on. Children are much more susceptible to the way in which they are fed than their elders often suppose. If a child be put in an uncomfortable posture, its food be too hot or too cold, and given from a spoon or vessel which imparts an unpleasant taste, it is no wonder that the child does not thrive. If those who prepare food for children invariably tasted their preparations, some instances of apparent loss of appetite might be readily explained. Young children appreciate cleanliness, and soon cease to relish food given from dirty and tainted bottles or spoons. It is often interesting to observe the success which one person may have in procuring the taking of food while another may utterly fail. A gentle manner, a strong firm touch, and the tact required to make a little child comfortable will often secure the taking of food, while the absence of these qualities is painfully felt by the child.

The food having been properly and successfully taken, the very important process of digestion and assimilation then demands attention. Here the rule should be absolute to follow nature strictly. No animal after undisturbed feeding will do anything but remain quiet if unmolested. In young animals, sleep usually follows feeding, but repose is the invariable law. The same procedure is absolutely demanded by

the child. So soon as feeding is done, the child must be made comfortable as regards its clothing and surroundings, and be left absolutely undisturbed, if possible, for an hour. In many cases this simple treatment will prevent colic, and secure the successful assimilation of food. The natural impulse of those who have children is to amuse themselves with the child whenever it is awake. No greater error can be made than to disturb the digestion of children by interfering with them after feeding. If a beginning be made in infancy, the child can be trained to lie quietly after taking its food without being disturbed and without disturbing others. Nervous children, so called, when treated in this way, speedily lose much of their abnormal sensibility, and often begin to gain at once.

It is often a common error to imagine that a child should be kept in a partially darkened room to secure its quiet after taking its food. Although the light need not fall directly in the child's face, a sensitive and nervous child is often far more quiet in a sunlit room than when blinds and shutters are partially closed. The warmth of sunlight is so commonly valued as an important factor in the nutrition of plants and animals that it seems strange that it should be so disregarded with growing human beings. It should also be remembered that digestion cannot go on unless the child has the needed amount of bodily warmth. This explains to a large degree the success of incubation, and gives a valuable hint for the management of children beyond the period of infancy. It is equally true that too high a temperature often prevents digestion in feeble children. Such are often improperly dressed, and when relieved from their multitudinous wrappings will often be able to assimilate food which otherwise they could not retain.

It is not uncommon to see children scantily supplied with water, the neglect arising because, as the child's food is often largely liquid, it is supposed that water is not necessary. Much of the restlessness which children display at times can be traced to thirst, and when relieved, the improvement in the child's condition is immediate and noticeable.

The striking influence of fresh air in promoting the nutrition of children is a common observation with those who see city children transported into the country or to the sea-shore during the summer. It is rarely the case that a sick child properly fed and kept at absolute rest in the open air does not speedily improve.

The assimilation of nourishment may be powerfully promoted by massage, accompanied with the rubbing into the skin of nutritious material; olive oil alone, or in combination with alcohol, may be em-

ployed during massage, with great benefit to the child. In cases where inunctions with cod-liver oil are beneficial, an increased amount of oil can often be given by combining it with a small quantity of tincture of green soap. The absorption of olive oil is promoted by combining it with alcohol, two parts of oil to one of alcohol. Oftentimes the child may first have a salt-and-water sponge-bath, followed by gentle massage with oil. In these cases the absorption of the fat is greatly promoted by the preliminary bath. Occasionally cocoa-butter may be used with olive oil, although, as a rule, the oil is better employed alone or with alcohol.

Another very interesting factor in these cases is found in the personal influence of the nurse or care-taker. The traditional belief in the value of old nurses is largely an error. Few old women have the physical strength and patience to care for a young child, but even putting aside the element of physical strength, the little child should be surrounded by those who are strong and vigorous, if possible. The best child's-nurses are older than twenty and younger than forty, and such seem often to impart a portion of their own vigor to their patients. When physical strength is coupled with a natural mothering instinct, the result is most satisfactory in promoting the growth and nourishment of children.

The value of baths in promoting nutrition is often overlooked in dealing with children. In cases of ill-developed children, with sluggish circulation, cold skin, and imperfect digestion, baths with friction are of the utmost value. Children do not bear the full bath so well as adults, but are greatly benefited by uniting bathing with manipulation. Very few children can bear a cold sponge-bath, and by far the best results are obtained from a warm sponge or from the use of tepid water. Alcohol and water, or dilute ammonia and water, furnish excellent baths, and are valuable in allaying restlessness and in securing sleep. For this purpose the bath should be warm and should be taken at bedtime.

Sea-bathing may be employed to great advantage with children under proper conditions. A locality must be chosen where the water is not cold, and the child must not be exposed to the full force of surf. Children should seldom bathe when the sun is not shining, as a chilly and damp atmosphere is most depressing to them. The hour of noon is an excellent one for the child's bath, and it may play in the salt-water and upon the beach so long as it is in motion and in the sunshine. A vigorous child can spend from fifteen minutes to half an hour, or even longer, to advantage in this way. The child

should then be taken to its bedroom, thoroughly rubbed and dried, and given a small amount of easily-digested food. It should then be put to bed, and made to remain in bed for an hour. Where the water is near the child's residence, its bathing-suit need not be removed until the child is brought, wrapped in a blanket, to its own bedroom. If it be well protected by woollen, it will not experience a chill in the transit.

The remarkable influence of the nervous system is rarely so well illustrated as in the nutrition of children. Every one who has to deal with children has noticed how readily assimilation is stopped by a fit of anger or fright, or by sudden interference. Many cases where children are ill nourished may be traced to the ill temper of a bad child's-nurse who vents her impatience upon her little patient. In other cases, the careless nurse does not give the child sufficient time to take its food, but hurries it away for her own convenience. The rule should be an invariable one with children that they are to be fed slowly and without annoyance, and that they remain unmolested for from half an hour to an hour after a meal. It must also be remembered that bodily warmth is necessary to secure the proper action of the nervous system in digestion. The skilful nurse will see to it that the child is not only undisturbed after feeding, but that it is comfortably warm. The converse is true in times of great heat as regards the maintenance of a proper degree of coolness in the child's external surroundings.

A most interesting point in connection with the nourishment of children lies in the formation in the child of proper habits of eating. When the child's natural appetite is recognized, it is often found that it has no taste for articles of food which would be most advantageous for its use. In these cases it is very important that the child be taught to eat properly. The best and simplest way to accomplish this is to give the child that which is best for it, and to give it nothing else. It may eat sparingly for a few meals, but will ultimately satisfy its appetite. No greater mistake can be made than to say in the presence of the child that it does not like a given thing and hence must not have it. The less the child's food is made a matter of discussion, the better for it, and if that which is prepared is well prepared and well given amid pleasant surroundings, there will rarely be occasion for discussion or for controversy. It is important to realize how valuable to the child are habits of proper eating. Only adults who suffer from the effects of badly-chosen food, and who can often trace the beginnings of dyspepsia to childhood, can appreciate the truth of this

statement. Certainly no greater kindness can be done a child than to establish a healthy and judicious choice of food.

The administration of narcotics, stimulants, and condiments in the case of children should be positively forbidden. This is often a result difficult to reach, as the impulse of the nurse is to share her tea or coffee with the child, or possibly an alcoholic stimulant. Thus a cook for children should remember that sugar and salt are the only condiments which childhood requires, and of these the latter is far the more valuable.

Last to be mentioned, but not least in importance, is the remarkable influence which sleep plays in nutrition. The ill-nourished child cannot sleep, and the sleepless child cannot assimilate, and precautions must be equally taken against both these abnormalities. If sleep can be procured, waking may be followed at once by the administration of food, and in obstinate cases the first beginnings of renewed digestion will often follow the child's nap. In using stimulants with sick children, the best result of stimulation is seen in the occurrence of sleep, and if this opportunity be utilized for feeding when the child wakes, the best possible consequences of the original stimulation will have followed.

Only those who have had experience with ailing children can appreciate the complexity of the problem embraced in the proper nutrition of the child. No dogmatic rules apply to all cases, and he who would successfully bring about health in childhood must do it by the patient observance of each individual peculiarity in his patient, and by a tactful use of the means which the child's environment affords. No more interesting and gratifying instance occurs in medicine than to witness the gradual change from peevish ill health to the happy and contented condition characteristic of the properly nourished child.

THE TREATMENT OF TONSILLITIS.

CLINICAL LECTURE DELIVERED AT THE CHICAGO MEDICAL COLLEGE.

BY WILLIAM E. CASSELBERRY, M.D.,

Professor of Therapeutics and of Laryngology and Rhinology in the Northwestern University Medical School (Chicago Medical College); Laryngologist to Wesley Hospital, etc.

GENTLEMEN,—The infectious nature of many cases of acute folliculous tonsillitis is now definitely established, yet other cases are seemingly of simple catarrhal origin, devoid of pathogenic germ-infection; it is therefore evident that one can distinguish and should describe with a view to treatment at least two forms of this disease,—infectious pseudo-membranous tonsillitis and simple folliculous tonsillitis. In addition, peritonsillar abscess or suppurative tonsillitis, while it may originate at times in either of the two former types, presents such a distinct clinical picture that it should be considered as a third form.

In this classification all degrees of inflammation excited by the Klebs-Löffler bacillus are excluded as belonging to true diphtheria, the treatment of which is not under consideration in this article.

Infectious Pseudo-Membranous Tonsillitis.—This is also termed croupous tonsillitis, tonsillitis lacunaris, diphtheritic sore-throat, and pseudo-diphtheria, although the latter term has been indiscriminately applied also to scarlatinous diphtheria and to all forms of membranous *pharyngitis* not caused by the Klebs-Löffler bacillus.

The infectious nature of certain cases of acute folliculous tonsillitis has long been suspected, yet the fact has not been generally credited, for the reason that, when the clinical evidence of infectiousness was conclusive, the disease would be attributed to diphtheritic origin or the subject be dismissed as a mere coincidence. We now know that the true *bacillus diphtheriæ* is not present in this disease, but that in the form described under the name of infectious pseudo-membranous tonsillitis, or croupous tonsillitis, there is present some one or more of several species of pathogenic micro-organisms,—e.g., streptococcus erysipelatosus, streptococcus pyogenes, staphylococcus pyogenes aureus,

staphylococcus albus, etc., and in such numbers and under such conditions as to justify the inference that they are the cause.

Infectious pseudo-membranous tonsillitis is characterized by a punctated whitish exudate, the spots of which are in size from two to four millimetres in diameter, and are attached around the follicular openings, appearing as if the crypts within were also lined by the same membranous material. Unlike the cheesy pellet, the exudate in its typical form is thin, translucent, and intimately connected with the underlying mucosa. Two or more puncta may join at their borders and form larger spots, but after cleansing away all muco-purulent matter this punctated conformation of even the larger areas can be readily discovered. In addition to the tonsils, any or all of the muco-lymphoid glands in the pharynx may be likewise affected, especially the chain of glands located just behind the tonsil and separated from it by the posterior pillar. Diphtheria can only be excluded positively by the absence of the Klebs-Löffler bacillus as determined bacteriologically, but, except in rare border-line cases, a differential diagnosis can be made with reasonable certainty and with greater promptness from the macroscopic signs and clinical symptoms.

True diphtheritic exudation may commence at the orifices of the crypts of the tonsil, but does not long remain limited to the tonsils and muco-lymphoid glands of the pharynx, as does the exudate of tonsillitis. It is true that in a few cases of apparent tonsillitis which showed only a punctated exudate virulent diphtheria bacilli have been found¹ and non-virulent diphtheria bacilli in a few others,² but in an overwhelming series of cases examined bacteriologically, in which a punctated exudate was limited to the tonsils or to the tonsils and muco-lymphoid follicles of the pharynx, only cocci were discovered.³ The proportion of errors in diagnosis based, with close scrutiny, on this rule has been found not to exceed five *per cent*.

The true diphtheritic membranes will within twenty-four hours proceed to form a diffuse plaque over the tonsil or will extend to the pillars, velum, or pharyngeal wall. By no means all cases in which a membranous exudate thus extends are diphtheritic, but when such an extension does occur the case is not one simply of tonsillitis, and the above rule for diagnosis ceases to apply.

¹ Koflic, New York Medical Journal, August 27, 1892, Scientific Bulletin, No. 1, by Biggs, Park, and Beebe.

² Abbott, Bulletin of Johns Hopkins Hospital, August, October, and November, 1891, Scientific Bulletin, No. 1, by Briggs, Park, and Beebe.

³ Jan Sendziak, Archiv für Laryngologie und Rhinologie, Zweite Band, Heft 2.

The punctated exudate of tonsillitis is thin, white, semitranslucent, presents a living clean aspect, devoid of necrotic change, and is but little raised above the surface; while the exudate of diphtheria, as a rule, is thickish or protruding from the surface, opaque, and dirty yellow, or rapidly becoming so,—appearances indicative of necrotic change.

Treatment of Infectious Pseudo-Membranous Tonsillitis.—The rheumatic diathesis is frequently associated directly or indirectly with tonsillitis, in which case salicylate of sodium, or the recently-introduced substitute, salophen, should be administered internally, in doses of gr. v to x, every three hours in capsules containing gr. v each, followed by a glass of water. It is not always possible to determine definitely whether or not there exists an underlying rheumatic diathesis; and the association, while almost universally accepted by clinicians, has recently been questioned. Nevertheless, benefit seems to result from a salicylic acid derivative, and the author constitutes it the basis of his internal medication in nearly all cases.

The administration of guaiacum has been founded upon a similar antirheumatic theory, but it would seem that a salicylic acid derivative is the better remedy.

For the high febrile action of the first day or two, it has been customary to give minute doses of tincture of aconite with potassium bromide, disguised in solution by a few minims of spirit of peppermint; but of late years phenacetin in doses of gr. iii to v has been substituted advantageously for the aconite and bromide mixture. This may be prescribed in separate capsules, or it may be mixed in capsule with salophen, salol, or sodium salicylate.

A saline laxative is nearly always needed.

Locally an alkaline and antiseptic spray or gargle should be used, as in the following mixture:

		Grammes.
R	Menthol	gr. iv 0.25
	Ol. eucalypti	℥xv 1.00
	Ol. gaultheriæ	℥xv 1.00
	Sodii bicarbonatis	ʒi 4.00
	Sodii boratis	ʒi 4.00
	Glycerini	ʒiss 45 00
	Aquæ, q. s. ad	ʒiv 120.00 M.

Sig.—Dilute, adding one to two teaspoonfuls to an ounce of water for use with an atomizer, and two tablespoonfuls to a glass of water for a gargle.

A spray is more effective than a gargle, provided the jet is made to impinge directly and forcibly on the inflamed tonsil surface itself; but

this can usually be done only by the attendant. Either the gargle or spray should be used every hour during the waking period; and every three hours, also, the spray should be used through the nose, running into the naso-pharynx, thus cleansing that cavity as well as the fauces of accumulated viscid discharge.

Hydrogen peroxide diluted to the point of freedom from production of smarting sensation is also an excellent local spray, especially if used occasionally in addition to the one above mentioned; or the physician himself may apply this drug directly to the part by a cotton swab, using gentle friction to cause the medicament to penetrate better and to disintegrate the exudate.

The author has used many remedies applied by means of a cotton swab, each and all of them at times with pronounced benefit, and again with but indifferent effects; among them "Monsel's solution,"—liquor ferri subsulphatis,—applied in full strength but sparingly, which he believes to be one of the best; guaiacol, recently vaunted as an abortifacient agent, but which seldom succeeds; and iodine, as in the following formula, which can be commended:

		Grammes.
R Iodi	℥ ss	2.00
Potassii iodidi	℥ ss	2.00
Acidi tannici	℥ ss	2.00
Glycerini	℥ ss	15.00
Aquæ, q. s. ad	℥ i	80.00 M.

Sig.—For local use.

A preliminary spray of one-per-cent. cocaine solution will minimize the discomfort of swabbing.

With intolerant children swabbing should be avoided, unless the gravity of the case would seem to render it imperative.

Scientific accuracy would dictate that a bacteriological examination be made in every case, in order to determine the dominating micro-organism, and that local remedies be then selected with direct reference to their destructive effect under existing conditions upon the germs present; for instance, it is stated¹ that liquor sodæ chloratæ quickly destroys staphylococcus, and mercury bichloride and Löffler's toluiol mixture, streptococcus.

Simple Folliculous Tonsillitis.—With the simple form there may or may not have been previous chronic hypertrophy of the tonsils; it is conditioned, if not caused, by "taking cold,—i.e., by refrigeration of some part of the body surface which determines vascular engorgement

¹ Jaques, "Diphtheria," The Chicago Medical Recorder, October, 1895.

of the tonsils exactly as in another individual it may occasion vascular engorgement of the nasal turbinated bodies. The tonsil swells, the follicular openings are obliterated, and the pent-up secretion acts as a further irritant; it becomes inspissated and mixed with epithelial *débris*; it is soon forced out to the surface of the gland in the form of "cheesy" pellets, which are altogether different from a pseudo-membrane, and which protrude from the narrowed follicular openings. Finally, when the tonsils are free of this accumulated *débris*, and at times earlier, if the globules are forcibly dislodged and removed, the tonsillitis rapidly subsides. It is not usually preceded by a distinct chill, and not accompanied by much fever or systemic depression. It is without evidence of primary parasitic infection as a cause, but it is capable of being transposed into a conglomerate variety of tonsillitis by secondary infection with pathogenic micro-organisms.

In fact, between these two types of tonsillitis are observed cases of mixed variety which present all degrees of approximation to one or the other type.

Treatment of Simple Folliculous Tonsillitis.—Internal medication is unnecessary unless the inflammation should border on the infectious type of the disease.

Locally, the same antiseptic and alkaline spray or gargle may be prescribed, and the same medicaments be applied by the swab.

Peroxide of hydrogen is especially useful, sprayed directly upon the parts, as it tends to disintegrate and expel the "cheesy" *débris*.

The most important point in local treatment is to dislodge and scoop out from the follicles, by means of a dull curette or long-handled ear-spoon, this accumulated, inspissated, and decomposing tonsillar secretion.

This done, the inflammation, soreness, swelling, and febrile action will subside in a few hours.

Inasmuch as chronic hypertrophy of the tonsils predisposes to such attacks, the tonsils should subsequently be abscised to prevent recurrence.

Peritonsillar Abscess, or Suppurative Tonsillitis.—This condition is also termed acute parenchymatous tonsillitis, phlegmonous tonsillitis, quinsy, etc., but of these terms the best is peritonsillar abscess, because it is descriptive, since, while the disease originates by infection of or through the tonsil, the suppuration does not culminate in the tonsil, but above in the connective tissue of the velum palate or elsewhere around the tonsil. This distinction is an important one, for it concerns the correct point for puncture, an accurate knowledge of which is

necessary for the early evacuation of the pus. Efforts to puncture through the tonsil, under the false impression conveyed by the name "abscess of the tonsil," for instance, are reasonably certain to result in failure to find pus, even though a quantity be present. Peritonsillar abscess may be either unilateral or bilateral, but when bilateral one side is usually inflamed a few days after the other side, and not conjointly.

The main point in diagnosis is to distinguish peritonsillar abscess in its earlier stages from the preceding types of acute folliculous tonsillitis,—in other words, to determine as early as possible when pus is present. On inspection of the throat, one will notice a characteristic distortion. The tonsil on the affected side is not particularly enlarged, but it is pushed downward and towards the median line of the throat by the swelling which is above and behind it, which swelling involves chiefly the velum and pillars, and tends to obscure the tonsil itself. With one side involved at one time the throat presents a decided inequality, the uvula being drawn towards or lying in contact with the swollen side. Lancinating pains dart through to the ear; deglutition is difficult; respiration troubled, and the jaw set,—that is, he is unable to open his mouth more than from a half to three-fourths of an inch.

In advanced stages it could only be confounded with acute infectious phlegmon of the pharynx and angina Ludovici or sublingual abscess.

Treatment of Peritonsillar Abscess.—In the first twenty-four hours an effort should be made to abort peritonsillar abscess by much the same systemic and local measures as have been recommended for the infectious pseudo-membranous type of tonsillitis. Cold applications have seemed of but little service. In my experience, one does not often succeed in aborting the disease; and after twenty-four hours, if the throat begins to assume the characteristic distortion already described, measures to encourage suppuration should be adopted,—for instance, frequent gargling with hot water, and the application to the neck of a hot poultice or a hot-water bag. As early as the third day one can puncture the abscess, evacuate the pus, and suspend all further suffering, provided one is careful to select the proper point for puncture. There are many arguments in favor of an early incision. Spontaneous rupture usually will not occur until the sixth to the tenth day, the sufferings of the patient becoming more and more intense the longer the delay. Not only suffering, but the dangers of the disease also increase with delay. The larger the abscess-formation the greater the liability to sudden complicating œdema of the larynx. While await-

ing spontaneous rupture fistulæ are apt to form and the pus to burrow in various directions, occasioning general cellulitis or suppurative pleuritis. The ascending pharyngeal and internal carotid arteries can become eroded by the suppurative process and fatal hemorrhage ensue.

The characteristically distorted condition of the throat is sufficient evidence of the presence of pus; "fluctuation" is difficult to distinguish with certainty, and as for "pointing," it does not take place until the abscess is about to rupture spontaneously.

A knowledge of the proper point for puncture is essential. Recognizing that the pus-collection is not in the tonsil itself, but usually in the velum palati, one can reach it most easily by a puncture directly through the velum just above and to the outer side of the junction of the anterior pillar with the velum. Attempts to puncture through the tonsil itself nearly always fail, and will certainly fail in the early stages of the disease. Any small bistoury may be employed, but a regular tonsil lancet, bayonet-pointed and slightly curved, with a long handle, is to be preferred.

Having applied a spray of five-per-cent. solution of cocaine, and again a ten-per-cent. solution by a cotton swab, the first incision is made in the form of a mere exploratory puncture. If pus flows, enlarge the puncture by incising towards the median line of the throat (away from the vessels) before the withdrawal of the lancet.

Failing to obtain an immediate flow of pus, next insert into the small wound a minute pledget of cotton soaked in cocaine solution. Following this, introduce a silver probe, which can be safely thrust about in the connective tissue of the velum until the pus is found and caused to flow. The object of making a mere puncture first and using the probe afterwards, when one must search for pus, is to avoid any possible wounding of blood-vessels.

HYSTERECTOMY FOR INFLAMMATORY DISEASE.

BY HENRY T. BYFORD, M.D.,

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THE dictum was never more true than to-day that he who opens the abdominal cavity should be prepared and able to perform any abdominal operation. The great French surgeon, Péan, and his followers claim that when the uterine appendages of both sides are to be taken out, the uterus as well as the appendages should be removed per vaginam. Baldy, Krug, and others in this country also remove the uterus with the appendages, but operate by way of the abdominal cavity, amputating the uterus at the internal os. Polk (who was the first to propose abdominal hysterectomy in all cases requiring bilateral oöphorectomy), Pryor, and others prefer to remove the entire uterus, including the cervix.

It is argued that after the ovaries are gone the uterus becomes a useless organ which frequently gives further trouble. Nature by its example would seem to favor removal of the uterus, for when the ovaries become atrophied either from senile or inflammatory changes the uterus likewise atrophies. Furthermore, the operation is rendered more complete and sometimes easier and safer.

On the other hand, it is held that the uterus should not always be sacrificed, because it is usually not sufficiently diseased to require it; that the removal often adds to the danger, and that the more of the sexual organs removed the more rapidly and completely will the sexual qualities be obliterated, a consummation not particularly to be desired in some cases.

Both parties have some right on their sides. The most potent influence in determining my course is that the patients as a rule stipulate that the uterus shall remain unless its removal is necessary to save their lives. People cling to all of the organs God has given them, whether

it be an eye, a tooth, a toe, or a testicle. When, however, the patients shall become educated to the belief that the uterus might as well go, I should expect to be guided by the amount of danger involved in each case. When the uterus is so much diseased that it is safer to take it out than to leave it, I would of course take it out, but when the appendages can be more safely removed without the uterus, and the uterus can afterwards be cured of its pathological conditions, I should leave it.

The operation we performed here a week ago was one in which I deemed it necessary to remove the uterus as well as the ovaries. The uterus, ovaries, omentum, and rectum were matted together about two pus-tubes, the condition having resulted from puerperal infection. After separating many of the adhesions we found that the right tube was firmly adherent to the uterus and that the pus-sac extended into the uterine horn. The safest operation, and only curative one, was to take out both the uterus and the appendages. After ligaturing the thickened broad ligaments from their infundibular edges across to the cervix, we amputated the uterus at the internal os, took a transverse wedge-shaped piece and as much of the cervical mucous membrane as practicable from the stump, and sewed the edges firmly together with chromicized catgut. As the stump was still somewhat vascular and liable to ooze, we separated the bladder from the cervix and upper end of the vagina, punched a hole into the anterior vaginal fornix and passed the ends of the catgut sutures (which were left long) down into the vagina for drainage. The peritoneal edge that had been separated from the anterior uterine wall was then firmly stitched with a continuous suture of fine catgut to the posterior wall of the stump, thus covering it and shutting it off from the peritoneal cavity. Then the abdominal incision was closed without drainage and the vagina packed with iodoform gauze. On the fourth day the gauze was removed and a one-per-cent. carbolic douche ordered twice daily. So far no untoward symptoms have arisen, and the patient may be said to be out of danger.

The woman upon whom we have just now operated also had a double pyosalpinx of gonorrhœal origin, but the adhesions, although firm, were broken up, and the appendages were freed of their adhesions. The uterine ends of the tubes were practically normal, and it was easier, quicker, and safer to ligate at the uterine horns and cauterize the stumps of the tubes with strong carbolic acid than to amputate the uterus. I did not use a drainage-tube because the oozing has ceased.

To remove the uterus and cervix in this case, which would have required a somewhat longer incision, the ligation or suture of the

vaginal edges, more time in its performance, and a greater exposure and disturbance of the intestines, would, I am certain, have been justified only by necessity.

Gonorrhœal pyosalpinx is the most common form met with in those who have never been pregnant, while puerperal (including abortion cases) sepsis is the common cause of the other cases of pyosalpinx. In virgins we should be on the lookout for tubercular salpingitis. In the gonorrhœal variety the walls of the tube are thicker and the peritoneal adhesions often less extensive than in cases of puerperal origin, hence the enucleation in the former is less liable to cause rupture of the sac and infection of the peritoneal cavity. The operation is apt to be easier and safer.

I expect to cure the endometritis in this case by local treatment after the effects of the operation shall have disappeared. If after two or three months I still find endometritis, I shall dilate the cervix twice weekly with round dilators, and apply a fifty-per-cent. solution of ichthyol in glycerin to the endometrium each time. Each of these treatments will be preceded by a copious vaginal douche of sterilized water and a swabbing out of the vaginal fornices and cervix with a five-per-cent. aqueous solution of carbolic acid through the speculum. Vaginal douches will be given twice daily. After a few weeks of such treatment, carbolic acid and tincture of iodine will be applied alternately each week to remove the submucous infiltration.

All of this will promote uterine drainage and asepsis, and cause the subsidence of the endometritis. If it does not cure it, the parts will at least be put in a condition to tolerate gentle curettage with a sharp curette, immediately followed by cautery with carbolic acid or a fifty-per-cent. aqueous solution of chloride of zinc, and subsequently by treatment as before the curettage, if such should be found necessary to complete the cure.

Let me warn you in closing not to attempt to curette the uterus without anæsthesia, as is sometimes done by the tyro. Anæsthesia is necessary in order to enable you to be thorough, and also to be sure of making a diagnosis of pathological conditions within the pelvis that might contra-indicate the operation.

THE TREATMENT OF PUERPERAL SEPSIS.¹

BY BARTON COOKE HIRST, M.D.

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THERE are so many forms of puerperal sepsis, so different in their manifestations, course and prognosis, and in their requirements for treatment, that it is impossible to lay down a general rule governing the treatment of the condition in every case. The easiest plan for describing the treatment of the different forms of puerperal sepsis is to take typical cases as examples of the different forms, and to describe the treatment most suitable to each. If a physician is called to see a woman three or four days after delivery and finds her with high temperature, a rapid pulse, and a foul-smelling discharge, his first duty is to thoroughly disinfect the womb. The technique of this procedure is not, I think, as well understood by the general practitioner as it should be. The instruments to be used and the operator's hands must be as thoroughly cleansed as if one were about to perform a major operation. An intra-uterine catheter, a curette, a double tenaculum, and a placental forceps are boiled for fifteen minutes. The woman is placed in the dorsal gynecological position. Her vagina and vulva are scrubbed with tincture of green soap, hot water, and pledgets of absorbent cotton. A vaginal douche is given. The cervix is seized with a double tenaculum and pulled down and out by an assistant. The intra-uterine catheter is inserted and the uterine cavity is flushed with weak sublimate solution (1-4000), from the fundus down, for two or three minutes. Then the curette, held lightly between the thumb and forefinger, is swept in all directions over the uterine wall. For this purpose a broad curette, such as was proposed by the writer some years ago, is best. The curette should be followed by the placental forceps (Emmet's curetting forceps), which should be opened and shut in all directions a number of times. The curette should again succeed the forceps, and the forceps the curette, until nothing

¹ Read before the Tri-State Medical Society at Cumberland, Maryland, December 12, 1895.

is brought away but a little fresh, bright blood. Next, the uterine cavity is again washed out with a bichloride solution of one to four thousand, or with plain boiled water. If the operator is in doubt as to whether the uterus is thoroughly clean, he may anæsthetize the patient and make a digital examination of the uterine cavity. This manœuvre, however, is not often necessary after labor, as the retained and infected material is almost always hypertrophied endometrium, which can easily be removed by the plan described above. After a miscarriage up to the sixth month the digital exploration of the womb is to be recommended. If the sepsis in this hypothetical case has been the commonest form,—decomposition of hypertrophied decidua and the absorption of the products of decomposition (ptomaines),—the symptoms will usually disappear within twenty-four hours. Suppose, however, in a given case that the disinfection of the womb is followed by no benefit. The symptoms persist in their original intensity, or perhaps are aggravated by the intra-uterine interference. The woman continues to have a very high temperature, with a rapid pulse, and profound prostration, while there are no signs of inflammation in or about the womb. The involution of the latter proceeds in a normal manner, and there is no trace of tenderness in the vaginal vaults nor a particle of exudate or other sign of inflammatory action within the peritoneal cavity. In such a case as this the physician is dealing with an infection of the blood-current and with phlebitis. The symptoms may be of an alarming character, and may persist a most discouraging length of time,—weeks and months, perhaps,—but the patient will recover in the vast majority of instances with no other treatment than a simple plan of stimulation and sufficient food and absolute rest to avoid embolism. The amount of alcohol should be governed by the height of the fever, reaching in some instances as much as a pint or more in twenty-four hours. If the pulse is rapid, digitalis should be used in comparatively large doses. Food should be given in the shape usually of milk, varied occasionally by beef extracts and peptonoids, every two or three hours. No interference with the genital organs should be attempted, as no good is thus done, and it will be found, after every intra-uterine irrigation, and especially after every attempt to use a curette, that the fever rises higher, and that all the symptoms are intensified. As the infecting micro-organisms have passed beyond the womb into the blood-current, nothing is gained by hysterectomy. In another case it may be that following the intra-uterine disinfection signs of inflammatory action appear in and about the womb. Exudates fill up Douglas's pouch and solidify the bases of the broad ligament.

There is great tenderness on pressure, and the womb remains enlarged and has a boggy feel. In such a case, if the exudate does not begin to disappear within forty-eight hours, and more especially if the symptoms of sepsis—high temperature and rapid pulse—persist, an abdominal section is indicated. The exudate alone is not the most serious symptom in such a case. I have seen the whole lower abdomen apparently solidified by peritoneal exudate and yet resolution occurred within a few days without leaving a trace of the trouble behind. The fever and rapidity of pulse disappear usually before the exudate is gone. What may be required when the abdomen is opened can only be determined by the appearance and feel of the intrapelvic organs. If the inflammation is confined to the ovaries and tubes, their removal is sufficient; but if the broad ligaments are involved, if abscesses have formed between their layers, if the uterus itself is the seat of inflammation, if there is suppuration or ulceration of its walls, a hysterectomy should be performed, with the removal of all the pelvic organs—uterus, broad ligaments, tubes, and ovaries—that can safely be removed. If, after opening the abdomen, the inflammation and suppuration are found to be entirely extraperitoneal, the abdominal incision should be closed and the pelvic abscesses evacuated by an incision above Poupart's ligament, or in the vault of the vagina. In another kind of case, in which the first onset of the symptoms is followed quickly by the appearance of the signs of a spreading suppurative peritonitis,—marked tympany, intense sensitiveness, anxious expression, ashy color, very rapid pulse, and possibly high fever,—an abdominal section is indicated, as rapidly as it can be performed, and as soon as the patient can be prepared for it. In very many of these cases the operation will come too late. By the time the symptoms justify it the progress of the septic peritonitis cannot be stayed. Once in a long while the operator will be fortunate enough to open the abdomen in time. I have had one such experience, in true suppurative unlimited peritonitis, out of a number of unsuccessful operations for the same condition. In again another class of cases the intra-uterine disinfection, which should be invariably the beginning of the treatment for every kind of puerperal sepsis, may be followed by no improvement of the symptoms. There is a very rapid increase in the fever, the pulse becomes steadily more rapid, and the patient shows hourly increasing signs of prostration. If there is no evidence about the womb of extension of the inflammation to the peritoneal cavity, if there is an abnormally foul-smelling discharge, and it is possible on distending the cervical canal sufficiently to see a peculiar dark-brown or greenish yellow exudate upon the endometrium, one is

dealing with a diphtheritic endometritis.¹ In such a case, if hysterectomy could be done soon enough, it would be the only means of saving the woman's life, but personally I have never seen such a case recover under my treatment. I have performed hysterectomy for this condition some four or five times, but invariably with a fatal result. I have seen the same result follow others' attempts at surgical intervention. In fact, with every kind of treatment, including continual irrigation of the uterine cavity, the result has been the same. If one could recognize these virulent infections of the endometrium before they had twelve hours' start, it would be possible to save the woman; but unfortunately the general symptoms of sepsis in such a case do not appear threatening at first, and by the time they do the woman is beyond all help. In still another form of puerperal sepsis, with a pseudo-membrane upon the endometrium, the outlook is not so serious. In these cases the exudate is white, and looks like the false membrane of tonsillitis, as contrasted with the false membrane of true diphtheria. There is nothing to be found in bacteriological investigation of such membrane in the womb, except streptococci and the micrococcus epidermidis albus. By frequent irrigation and thorough cleanliness, with stimulation and support, these cases almost always recover. The most marked example I have ever seen of this form of sepsis was caused by a sloughing myoma after labor. I urged upon the patient and her friends the necessity of an operation, but I was not allowed to perform it. Under stimulation, good nursing, and frequent irrigation of the uterine cavity the woman made a good recovery.

It may be that the false membranes are confined to the vaginal mucous membrane, and that they are not extensive. In this situation the site of infection is easily reached and dealt with. The application of strong cauterants—chlorides of zinc and nitrate of silver—will disinfect the infected areas. With this possibility in mind a physician should make it a rule of practice to examine the vagina with a speculum in every case of puerperal sepsis. The infection of the lower parturient tract, however, is exceptional. In the vast majority of puerperal infectious fevers the site of infection is the uterine cavity.

¹ By this I mean a mixed infection of the endometrium in which streptococci, the bacillus *foetidus*, and the bacillus *pyocyaneus* may be found. I believe, in some cases, it would be possible to find the Klebs-Löffler bacillus, though I do not know that this has been done. Clinically the analogy between diphtheritic endometritis and diphtheria of the throat is perfect.

Medicine.

TWO CASES OF SMALL-POX (VARIOLA VERA AND VARIOLOID).¹

CLINICAL LECTURE DELIVERED AT THE CHARITÉ HOSPITAL, BERLIN.

BY C. GERHARDT, M.D.,

Professor pub. ord., Director of the Second Medical Clinic in the University of Berlin.

LECTURE II.

GENTLEMEN,—I have just learned that two cases of small-pox entered this hospital the day before yesterday. They are lying in one of the pavilions of the Department for Infectious Diseases, under the care of Professor Koch. Small-pox has become such a rare disease in Germany that it would be wrong to let an occasion like this pass unused: we shall therefore avail ourselves of Professor Koch's permission and visit these patients. But before going I wish to give you a short review of the subject.

Small-pox was, and in many countries still is, a common and widespread disease. Even in this country you find a number of people whose pock-marked faces tell the tale of what they have passed through. The origin of small-pox is to be sought in the East. Its nature assigns it a position among acute infectious diseases, although it was the habit in many places to put these patients in the wards for skin-diseases, the skin being the main visible seat of trouble. Some authors have classed it among children's diseases, infants before vaccination being very susceptible. Small-pox in this respect resembles allied contagious affections,—measles and scarlatina,—that the patient after he had caught the disorder at first shows no signs of infection having taken place, but appears to all intents and purposes quite well and healthy. Just as seed sunk into the soil grows invisibly till the young shoots show above ground, thus the germs of small-pox—of whose nature, by the bye, we know next to nothing—invisibly increase within the system till about the thirteenth day. That is the average length

¹ Reported by H. Cleves-Symmes, M.D.

of incubation, according to the numerous and careful observations of Baerensprung made in this hospital; my own experience agrees with his.

After the preliminary stage of incubation the disease proper sets in with violent rigors, headache, lassitude, severe pains in the limbs, and lumbar pain; great weakness and pain in the back, frequently simulating injury to the spine; nausea, vomiting, a tendency to bleed from the nose, and tenderness in the epigastrium about the xiphoid process. The pains in the limbs are often mistaken for articular rheumatism. The temperature is apt to rise as high as 104° to 106° F. (40° to 41° C.), at the same time the pulse is correspondingly frequent, and the usual concomitant symptoms of high fever are present. After the lapse of from two to four days the fever subsides, and a number of papules break out in its stead. The eruption, as a rule, begins in the face and on the scalp in the shape of minute, distinct papules, about the size of a pin's head, sensibly elevated above the surface of the skin, and feeling peculiarly hard, like small shot, beneath the fingers. The surrounding skin is in a condition of œdematous swelling, most manifest in the puffed eyelids, which almost preclude vision. Thence gradually, on the same day, or within a day or two, the eruption travels downward, and successively involves the neck, shoulders, hands and arms, trunk, legs and feet. Then, with the peculiar slowness that distinguishes each phase in true small-pox,—the course of vaccinated pox is more rapid, and most rapid of all is that of chicken-pox, which lasts but a few days from beginning to end,—these papules increase in size, are changed into circular vesicles, filled with a colorless fluid, depressed in the centre, and having an inflamed areola or margin. These vesicles in turn grow larger and become purulent, resulting in conical umbilicated pustules. Papules and vesicles are merely different degrees of œdematous infiltration of the rete mucosum. That explains their subdivision into numerous compartments, the walls of which are formed by the flattened cells of the Malpighian layer. The central depression is owing either to the presence of the duct of a sweat-gland or a hair-follicle, whereby the epidermis is rendered more firmly adherent to the corium; or it may be owing to lack of support from beneath, the central net-work of the pustule having been destroyed; or it may be simply the consequence of desiccation. Ever so many treatises have been written on this feature, which yet is by no means peculiar to the disease, but is found in pustules of whatever origin; pustules artificially produced by means of tartar emetic, for instance, exhibit this same umbilication. The only thing really peculiar to

the pustules of small-pox is the extreme infectiousness of the pus contained in them. Instead of provoking merely local suppuration, it leads to a general infection of the whole body and to the outbreak of the disease.

In many cases hemorrhage takes place between and within the pustules, giving them a grayish-black appearance, whence the much-feared name, *black pox*. When to the fear of infection you add the fetid odor of decomposed pus and of the discharge of numerous abscesses, you may well understand the loathing with which men used to regard this disease. According to the characteristics of the pustules, distinctions have been made between a *variola verrucosa*, where the individual pocks stand out in distinct knobs, each about the size of a pea; *miliaris*, where they resemble the small pimples of miliaris crystallina; *confluens*, where, as the name implies, they join in huge blisters, particularly in the face. *Variola hemorrhagica* is distinguished by an outburst of blood on the free surfaces of the body; the petechial spotting on the skin may vary in size from a pin's head to an inch in circumference. More or less abundant loss of blood from the mucous membranes takes place at the same time, threatening a fatal termination. There are other forms of the disease where few or no pocks are found, and which yet are small-pox,—the so-called *febris variolosa sine variola*, in which the fever too is of a very mild character.

The fever in small-pox, after setting in with rigor, remains high for from two to four days, showing, as a rule, three great elevations on the temperature-chart. After that it goes down to normal; there to remain for a couple of days, and *then to rise again*. The secondary fever sets in about the ninth or tenth day, when the maturation into pustules has taken place; it is also called suppurative fever therefore. Never in variola vera will you find this secondary rise of temperature missing. In varioloid, on the other hand, the fever is confined to an initial rise in all respects resembling the one in genuine small-pox; once that is over—and here comes in the great difference—the temperature permanently remains at normal level. The suppurative fever in small-pox is characterized by extreme restlessness, sleepless nights, and by delirium, especially at night. Great care in the supervision of patients is required about this time, as the delirium is apt to come on very suddenly, with surprising results sometimes. I remember one case at Jena, where I was in charge of the medical clinic at that time. The nurses were off their guard and sleeping, when the patient suddenly rose and made for the door. Then followed a wild chase through the little town, the patient in his night-shirt leading, with a

string of nurses at his heels. After the suppurative stage comes the *stadium exsiccationis*, in which the pocks begin to shrivel and dry,

FIG. 1.

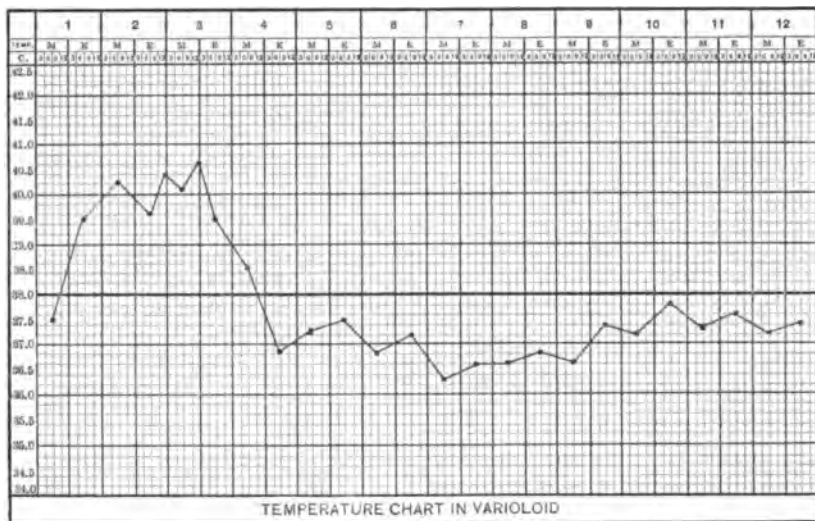
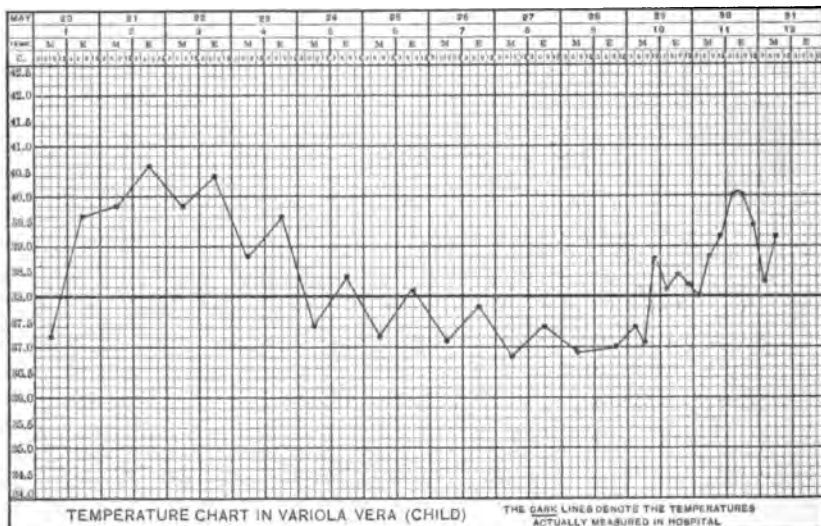


FIG. 2.



and then, about a fortnight after eruption, the period of *decrustation*, frequently accompanied by a new rise of temperature,—the “fever of decrustation.” Numerous scars remain, at first red and raised; later

on white and shrunken. In the face they may give rise to ectropion, and when numerous they give the features quite an altered expression, owing to the drag on the skin of the many small cicatrices. The skin for a long while after appears covered with a multitude of pigmented spots.

I have already touched upon the difference between variola vera and varioloid. The latter is small-pox changed in character by one of three causes: a previous attack, inoculation, and vaccination. Its modified nature is revealed by the lack of secondary suppurative fever; by the rapidity with which the eruption spreads, very different from the slow and thorough course of true small-pox; and, lastly, by the irregularity of the eruption. Whereas in variola vera the pocks in any particular region are all of the same size and age, and consequently in the same stage of involution and presenting almost exactly the same appearance, you will find in varioloid old and recent excrescences side by side; in one spot you may find a pustule and close to it a pimple at so early a stage as not yet to have developed a vesicle, and again not far off scabs may be perceived. Wherever you find this condition you may confidently assume the presence of varioloid. Furthermore, the pocks are by no means so densely packed as in the genuine prototype of the disease. To condense the matter in a few words we have in

Variola :

1. Secondary fever.
2. Slow development.
3. Uniform appearance.

Varioloid :

- No secondary fever.
- Rapid development.
- Manifold appearance.

To this may be added that varioloid leaves few or no visible scars. I understand that one of the two patients we are going to see was vaccinated in her youth; you will thus have occasion to verify our differentiation.

The eruption is not confined to the skin, but extends to the mucous membranes, notably of the mouth and pharynx, but also along the respiratory tract and the œsophagus. Difficulty in swallowing and salivation, hoarseness that may pass into complete loss of voice, and bronchitis manifest various localizations within the mouth, the larynx, or the bronchi.

I have already mentioned that the nervous system is very prominently affected by the fever, and that delirium is no unusual occurrence. Disturbances in the muscular system take the shape of rheumatic pain, particularly in the back, where it is hardly ever wanting in the initial

stage. At that period an eruption other than pocks is observed in the skin in many cases. It is a kind of erythema or hyperæmia, consisting of light- or dark-red spots, and exhibiting a preference for the inner aspect of the thighs, the region of the knees and elbows, as well as of the dorsum of the foot.

Various kinds of paralysis may occur as sequelæ, also affections of the spinal cord resembling locomotor ataxia, or sclerosis of other systems within the cord. At the climax of the disease, on the other hand, various inflammatory complications are apt to set in, pre-eminent among which are pneumonia and pleurisy. Thus in small-pox the vulnerability of the internal organs appears to be increased, just as in measles the conjunctiva and the lining of the air-passages are affected, and in scarlatina the throat, and later on the kidneys are apt to be implicated.

The contents of the pustules I told you were highly infectious, so is also the blood, so is, in fact, everything about the patients. Since the air is capable of transmitting the infection, we may conclude that minute particles, perhaps from the skin, are floating about in it. In most cases the disease is caught by inhalation of contagious air: a short sojourn in the same room is sufficient. The disease is even known to have been carried across narrow streets in summer where the windows were kept open, befalling inmates of the opposite house. Another peculiarity of the contagion lies in the length of time during which it will cling to an object; paper money, worn clothes, and particularly blankets, have thus often served to keep the disease going long after it was supposed to be extinct.

As a general rule, infants before their first vaccination and old people, in whom the protective power of vaccination has gradually worn out, are most liable to catch the disease; another period of predilection is the age midway between twenty and thirty years. There are individuals, though, that are personally absolutely proof against the disease under all circumstances. The great Morgagni was one of the first to put a stress on this fact. Others again are particularly liable to the disease; you will find illustrations of this tendency in your vaccinating practice, some of your subjects reacting upon the virus every time, however often you may vaccinate them.

The importance of an early diagnosis is very great, in view of the highly contagious nature of the affection. Unfortunately, it is hardly possible to be certain in this respect within the first three days, before the tell-tale eruption has come out, unless you happen to know that there was occasion for this particular kind of infection. The disease

has been confounded with measles, scarlatina, and various other exanthemata. In one case *rupia* was diagnosed, and the patient accordingly turned over to the skin department, where he came in contact with a number of other persons, who caught the disease and spread it throughout the town where this happened. Diagnostic mistakes do not always entail such grave consequences. It is a good deal better when the mistake lies the other way, as in the case of the man with the itch, who was condemned to temporary single confinement on the supposition that it was small-pox he was suffering from. I mention these cases to show you what mistakes have actually occurred, and may occur again, if the physician has not previously seen the disease with his own eyes.

Chicken-pox is an utterly different disease, in no wise related to small-pox. This is made plain by the fact that they do not confer mutual immunity: vaccination will take effect on a (non-vaccinated) person having just had an attack of chicken-pox, he will likewise be liable to take small-pox, and *vice versa*. There is a certain resemblance in the papules of both diseases, only that in varicella pus is never formed, and the eruption generally disappears before the fifth day, leaving behind it no cicatrix or mark. Fever may, or may not, occur in varicella, but where it is met with it does not precede but accompanies the eruption.

Like measles and scarlet fever, small-pox is contagious at a period where the patient still feels quite well and has no idea of his condition. A case in point is frequently quoted. A man had skin grafted on his leg from a leg that had just been amputated from a person in apparently good health. This latter was taken with small-pox the day after, and the man with the grafted skin fell ill of the same disease. This is but one of many instances going to show that there is a danger of contagion as early as in the latter part of the period of incubation. The dead body is also already at this stage liable to spread the disease. Even healthy persons *who remain healthy* may infect others. A sad example of this happened to a student of mine at Jena, whose work lay in the small-pox ward. Returning home for his vacation, he brought the disease to his mother and sister, of whom the former died; he himself was never taken ill.

As to treatment when once the disease has established itself, we possess no specific remedy,—nothing that will in any wise influence its course. All sorts of things have been tried, naturally, but that is the plain outcome of it all so far. One slender chance is offered by speedy vaccination; of that I shall have something to say later on.

All that we can do is in the way of affording symptomatic relief. High fever may be encountered by tepid baths and antipyretics; the pains in the back and the vomiting may require subcutaneous injections of one-sixth grain of morphine. The patients of course are kept in bed, in a cool room. Their food should be cool and fluid if the mucous membranes are involved. After the pustules have matured they should be kept covered with salve spread on clean linen or gauze, so as to be protected from dirt and infection, like so many ordinary wounds. To the lanoline or vaseline constituting the salve may be added some nitrate of silver, which stimulates cicatrization and the production of new epidermis. The mouth should be cleansed repeatedly with some mild antiseptic (weak boracic lotion, permanganate of potassium) to avoid suppuration of the parotid gland, which is liable to get infected by way of Steno's duct. Regular baths twice a day should not be forgotten; they serve the double purpose of general cleanliness (particularly difficult to obtain by other means in children) and of allaying the irritation of the skin. While treating the individual patient we must not lose sight of the danger with which he threatens the community. He must be strictly isolated, so as not to become the starting-point of an epidemic. Even the windows of the room in which he lies should be kept closed, unless you are far enough away from other human habitations.

This brings me to the subject of the preventive treatment of small-pox. Preventive medicine has achieved her first and so far greatest triumph in this disease. It is not my intention to enter upon the details of this most interesting and important subject. Passing over the original practice of inoculation, I merely wish to mention the principle of Jenner's great discovery, now nigh unto one hundred years old. By passing through the body of a species less susceptible the poison loses so much of its strength that the disease it produces after that is neither dangerous *nor contagious* any longer. Yet the protection thus afforded is almost as great as by genuine small-pox. Jenner's method has been the forerunner and model of all our most modern attempts in therapeutics. I need here but remind you of Pasteur's work in regard to hydrophobia and anthrax, and of the labors of his successors. So great has been the success of vaccination that mankind, all but the profession, have almost forgotten what a scourge small-pox used to be, and that a widespread agitation has been and is at work trying to do away with one of the most beneficent institutions that has ever existed, on the strength of most paltry reasons. Formerly, when facilities for procuring animal lymph were few, it

was the practice to perform succeeding vaccinations with lymph taken from the first patient's arm. In this way it happened that, in very rare cases, syphilis was transmitted. Nowadays lymph is so easy to get that we can do entirely without humanized vaccine, thereby removing all chance of syphilis being acquired, since animals are not subject to that disease. If one is obliged to use human lymph, he should, in addition to all his other precautions, have a care never to take it from an infant under four months. Up to that age there is a possibility of hereditary syphilis being present, yet not detectable by any means at our disposal. The immunity conferred by vaccine lasts long; not, however, during the whole of life,—subsequent vaccination or vaccinations must therefore follow at certain intervals. These details you will be taught in the vaccinating course which forms part of your curriculum.

I would counsel those among you on whom vaccination on former occasions has not taken effect, or who have not been vaccinated within the last ten years, to have the operation performed once more before they go to see our small-pox patients. Or they should have it done directly after. The result would be about the same, as the incubation period in vaccina—four or five days—is sufficiently much shorter than in variola—from ten days to a fortnight—to allow of the former producing immunity before the latter has had time to develop its virus.

CASE I.—M. C., Italian, nineteen years old, married, by occupation a washerwoman, has always enjoyed good health. She was vaccinated in her third year; has not been revaccinated since. She fell sick on the 20th of May with high fever, headache, pains and extreme weakness in the small of her back, and vomiting. The eruption came out on the 22d, first in the face in the shape of sparse pimples with a red, elevated areola, then on the arms, with new ones in between on the face. The legs are but very slightly shrunk. The fever fell simultaneously with the appearance of the outbreak; the temperature has been normal ever since.

She does not know how she came to contract the disease, unless it was owing to her having done some washing on the 15th instant for five countrymen of hers just arrived from Italy.

CASE II.—C. C., a well-built and well-nourished little girl of two years, niece of the former, has not been vaccinated owing to "general debility." She fell ill with high fever and vomiting, and much pain, at the same time as her aunt did. The papules in her case came out on the third and fourth days, the fever subsiding about the same time. They started in the face, thence extending to the arms, chest, and legs.

They are most densely packed in the face, the intervening skin being red and swollen with oedema. The eyes are almost quite closed by oedema of the lids. There are but few pocks on the scalp. The eruptions are everywhere bounded by an inflamed margin. The temperature has risen again on the tenth day, coinciding only with the maturation of the pustules. See fever chart, Fig. 2. The spleen grows to the axilla.

These two patients, gentlemen, I mention for our purposes of clinical demonstration, and I think also for the woman present in a very marked manner the distinguishing features of *variola vera* and *variola*.

The child you see densely spotted with pocks, all but the abdomen, where they are scattered farther apart. Its flushed condition and restlessness direct your glance to the temperature chart at the head of the bed, where you find your suspicion of fever confirmed, the last marking being 40° C. ($=104^{\circ}$ F.). You will notice, at the same time, that the chart agrees with what I told you a little while ago; there is the initial rise with the three main elevations, after that an interval of nearly normal temperature, and finally the rise of suppurative fever coincident with the full development of the pustules. The woman, on the other hand, is as free of fever as you or I; in her case no secondary fever has followed upon the initial rise.

Again turning your attention to the child, you will notice how densely and evenly the pustules are disposed (see Fig. 3); you will note that they all look the same,—pearly-gray eminences the size of a pea, some with, others without, umbilication, all with red margins. In the face many of them have become confluent, and so have their inflamed surroundings, producing a huge general oedema of the face. The eruption continues into the meatus of the ear and into the nose, and now that the child cries you perceive yellow spots of the eruption even in the mucous lining of the mouth. The voice is hoarse, and there is slight cough,—signs of the affection having spread to the larynx and trachea. All the pustules look alike; there are no younger efflorescences among them that have not yet matured, nor do you perceive any members of an older generation covered by this time with scabs,—they are all of one and the same crop. Compare with this the condition of the woman (see Fig. 4). Most of the pocks there are scattered irregularly and widely apart from each other. They exhibit various stages of development side by side,—pimples, scabs, and typical pustules.

I may add a remark as to the outcome. The woman plainly is



FIG. 3.—Varicella vera in the pustular stage.



FIG. 4.—A case of varioloid.

They are most densely packed in the face, the intervening skin being red and swollen with œdema. The eyes are almost quite closed by œdema of the lids. There are but few pocks on the scalp. The eruptions are everywhere bounded by an inflamed margin. The temperature has risen anew on the tenth day, simultaneously with the maturation of the pustules. (See fever chart, Fig. 2.) The spleen proves to be swollen.

These two patients, gentlemen, fortunately for our purposes of clinical demonstration, and luckily also for the woman, present in a very marked manner the distinguishing features of variola vera and varioloid.

The child you see densely spotted with pocks, all but the abdomen, where they are scattered farther apart. Its flushed condition and restless tossing direct your glance to the temperature chart at the head of the bed, where you find your suspicion of fever confirmed, the last marking being 40° C. ($= 104^{\circ}$ F.). You will notice, at the same time, that the chart agrees with what I told you a little while ago; there is the initial rise with the three main elevations, after that an interval of nearly normal temperature, and finally the rise of suppurative fever coincident with the full development of the pustules. The woman, on the other hand, is as free of fever as you or I; in her case no secondary fever has followed upon the initial rise.

Again turning your attention to the child, you will notice how densely and evenly the pustules are disposed (see Fig. 3); you will note that they all look the same,—pearly-gray eminences the size of a pea, some with, others without, umbilication, all with red margins. In the face many of them have become confluent, and so have their inflamed surroundings, producing a huge general œdema of the face. The eruption continues into the meatus of the ear and into the nose, and now that the child cries you perceive yellow spots of the eruption even in the mucous lining of the mouth. The voice is hoarse, and there is slight cough,—signs of the affection having spread to the larynx and trachea. All the pustules look alike; there are no younger efflorescences among them that have not yet matured, nor do you perceive any members of an older generation covered by this time with scabs,—they are all of one and the same crop. Compare with this the condition of the woman (see Fig. 4). Most of the pocks there are scattered irregularly and widely apart from each other. They exhibit various stages of development side by side,—pimples, scabs, and typical pustules.

I may add a remark as to the outcome. The woman plainly is



FIG. 3.—Varicella vera in the pustular stage.



FIG. 4.—A case of varioloid.

near recovery, and she will retain no scars. In the child's case the outcome is yet doubtful ; the case is not a very severe one,—there have been no hemorrhages of any kind. We have reason to hope that the good care she is under will enable her to live down the fever, which is not devoid of danger. As to scars, she is most likely to keep a lot of them. The treatment consists in what I told you of. She is kept swathed in aseptic bandages spread with nitrate-of-silver salve, and bathed twice a day.

[REMARK.—Both patients made good recoveries. No pitting took place in the woman, and but little on the face of the child. One of the visiting students caught the contagion, and transmitted it to another person. The disease manifested itself on the fourteenth and nineteenth days in the shape of varioloid. Both cases were promptly isolated, and recovered. No further cases occurred.]

TREATMENT OF ENTERIC FEVER.

CLINICAL LECTURE DELIVERED AT ST. BARTHOLOMEW'S HOSPITAL, LONDON.

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GENTLEMEN,—There is just now a good deal of enteric fever prevalent,—in fact, at the present time there is an epidemic of enteric fever in London. I believe that at this moment we have twelve cases of enteric fever in our two wards, and I understand that every day the house-physicians here are sending away cases which it is not possible to admit.

At this time of the year,—the early autumn,—and the autumn season generally, typhoid fever is commonly prevalent. We do not yet know all the conditions which cause that to be so, but we recognize it as a fact that we are likely to meet with many cases of enteric fever from this time onward for the next three or four months. No doubt the fact is determined by some conditions of a specific character, for we now know what enteric fever is due to. We know that it is a disease due to the introduction into the system of a specific germ. Professor Eberth is credited with having first defined and described this germ, and after this lecture those interested in the matter will be able to see under this microscope a preparation of the bacillus of Eberth, and you see in this tube a pure cultivation of the specific bacillus of typhoid fever, grown upon gelatin. We are not concerned to-day with the bacteriological aspect of enteric fever, but I want to call your attention to some of the prominent and leading symptoms of the disease, and then to spend the greater part of our time in describing the best methods of treating the patient.

We now know the natural history of enteric fever. An untreated case of enteric fever may turn out very badly, but, on the other hand, it may turn out fairly well. The fact is that in this case, as in all other cases of germ disease, the patient may have a small or a large dose of the toxine generated. In other words, enteric fever may be mild, or it

may be very severe. There are, indeed, what are called abortive cases of enteric fever, where we may suppose that a very small dose only of the germ has been introduced into the system, where it lives but a brief space, possibly because the phagocytes in the body are particularly strong and capable, and so prevent the process from going any further. At all events, there are certainly cases so mild as to be considered abortive examples of enteric fever. These, of course, are very difficult to analyze. Many such cases used to come in here, and were called cases of febricula. The patient was ill for only a week, but he had all the appearance of a typhoid fever patient, and one supposed that he would go on as others did, but somehow his temperature fell, and he soon recovered. Of course, in these abortive cases we have no means of putting our diagnosis to the proof by any *post-mortem* examination, and we can only judge by the nature of the symptoms.

Enteric fever is especially a disease of young people; it becomes rare after forty years of age. While childhood is not exempt from the disease it is most severe at a period between twenty and twenty-five years of age. It is a well-established fact that about a quarter of the deaths from enteric fever occur in patients at the age of twenty or twenty-five. As people grow older, I suppose they become less susceptible to the action of the germ, and it is quite certain that those parts of the body which are the seats of selection of the germ become wasted in old people. I mean that the solitary glands of the intestine, together with other glands in the body, undergo a process of involution, with a diminution of their functional activity. But the lymphatic and glandular system generally in young people is very active and vigorous, and any diseases occurring in the lymphatic and glandular system of the young are apt to be more acute and severe than in an adult or in persons late in life.

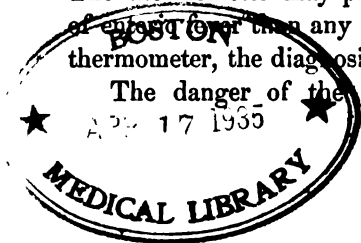
The duration of the disease is about four weeks. You find cases sometimes which recover at the end of three weeks, and you will also see other cases, in the wards and elsewhere, where the patient continues to be ill for five, six, seven, eight, nine, or ten weeks, but when you have cases of such a duration as that, you may be quite sure that it is not one single attack of enteric fever, but that the illness consists in all probability of a series of attacks. In other words, the patient is apt to suffer a relapse, for a relapse is exceedingly common in enteric fever. A single attack, you will remember, is a twenty-eight-day fever. By that time, if all goes well, and the patient is carefully treated and shielded from all possible complications, you expect to find the fever leaving him and convalescence setting in. No method of treatment,

no remedies that we know of, have ever had, or seem likely to have, any effect in aborting the process. There is no instance on record of a case of enteric fever which had once fairly begun ever having been cut short or aborted.

Now, the early symptoms, which put you on the alert to make you suspect that the patient has typhoid fever, are, first, a general feeling of malaise. The patient does not feel well, does not know what is the matter with him, begins to feel miserable, unfit for his work, languid and chilly, perhaps has headache, and a disagreeable taste in the mouth,—commonly described as a bitter taste,—which lasts for some time, and this condition is followed by fever. The patient thinks very often that he has caught cold, or that his liver is out of order, or perhaps that he has got very low and requires feeding up. After adopting any one of these views he proceeds to take an aperient to act upon his liver, which is not a very wise thing to do, of course, under the circumstances, but he does it in good faith; or else he thinks he is low and weak, so he proceeds to feed up,—takes more food and more wine, and tries to recover his health by those means. Or he, perhaps, thinks that he is merely out of sorts, and proceeds to take more exercise to throw off all these ill feelings. Any one or all of these methods—taking more food, more stimulant, more exercise—are certainly bad, and especially the practice of taking an aperient. All these, as you can understand if you have to deal with a true case of enteric fever, are likely to be very serious measures, and are all of them dangerous. Still the patient does not know what is the matter with him, and perhaps he does not think himself ill enough to call in medical advice.

But supposing he is wise enough to call in a physician promptly, it is often very difficult for the practitioner to make his diagnosis at once. It is, I repeat, very difficult, indeed, in the early stages of enteric fever, to be sure what you have to deal with. You may suspect it, and as a matter of fact you always should suspect the possibility of enteric fever in any case of fever which you cannot readily explain. When you cannot find out why the temperature goes up repeatedly on successive nights—one degree perhaps every night—for several nights running, that fact should certainly put you on the alert to suspect enteric fever, because it is very characteristic of the disease. The thermometer may prevent more mistakes in the early diagnosis of enteric fever than any other means. Before the days of the clinical thermometer, the diagnosis was much more difficult.

The danger of the aperient you can readily understand; the



danger of the fatigue, perhaps, you do not quite so readily see. Suppose a patient is taken ill with enteric fever a long way from home,—people encounter Eberth's bacillus frequently on their travels, especially in many parts of the Continent, where the drainage is bad and the water-supply is more than doubtful, and in that way, through defective sanitation and bad water, great risks are run of these bacilli being taken in by the lungs or swallowed with the food. The patient then may be taken ill at a distance from home, say in the south of France. He leaves home perfectly well, or perhaps for his health, and he becomes seriously ill. The diagnosis of typhoid fever is made, and the first instinct of that patient, when he realizes that he is in for a severe illness, is to get home. Perhaps he is in the hands of people whose language he does not speak well, or in a hotel, or in lodgings, and he naturally wishes to return to his friends. Very often, and most unwisely, he proceeds to make the best of his way home. That means a journey of perhaps two days and two nights, and then this unfortunate patient, who is already the subject of typhoid fever, delivers himself into the hands of his family or his friends a complete wreck, only able to crawl into bed, greatly exhausted after the fatigue of his trying journey, and having had very improper food. By this procedure he has put himself into the worst possible condition for recovery.

The first thing, then, to do with a patient who is suffering from enteric fever is to put him to bed wherever he is, and make him stay there. Whenever a telegram comes to you saying "So-and-so is ill with enteric fever, shall we bring him home?" you or your medical adviser—and people should always consult a medical man under such conditions—should say, "Let him stop where he is," and not run the great risk of bringing him home. That will often save life, and it has often done so, whereas the other procedure has again and again proved fatal to young and valuable lives. There is great danger in fatigue by long journeys or long walks in the early stages of the disease; absolute rest in bed is necessary. In any acute and severe illness, the best plan is to get your patient into the best room you can secure for him. I often say that no room is too good to be ill in. You want to have the best room in the house; one with a good outlook, plenty of cubic space in it, plenty of doors and windows, and with all arrangements that lend themselves for nursing; hence no room can be too good for the purpose. If possible, have two rooms, one *en suite* with the other,—one for the day and one for the night. If possible, have two beds for your fever patient, one for the day and one for the night.

The patient is readily passed from one to the other. Secure two good nurses, one to relieve the other. You cannot well do with less. Of course, all this, you will say, is costly; but a severe illness is always an expensive thing; but that is of little moment, and if you can only save life, you must not think of the expense, but you should always try to do the best thing that you can for your patient. At all events, it is absolutely necessary that you should know what are the best procedures, as sometimes they are the only means possible to save life.

The next thing to concern you is how the patient is to be fed. Knowing, as I suppose you do, that these bacilli make their special *habitat* in the intestines, although they will ultimately go all over the body and be found in every solid and liquid, still the points of the specific selection for these bacilli are the solitary and agminated glands of the small intestine, from the lower part of the duodenum down to the ileo-cæcal valve, the process increasing in intensity downward. Sometimes the special infection occurs in the large intestine, and you will find small scattered typhoid ulcers in the large intestine, but not always. Knowing, then, that the process is one of progressive swelling, softening, ulceration, and necrosis in the solitary and agminated glands, a very little knowledge will tell you that you require to be most careful in prescribing the food for a patient suffering from this disease. When the mucous membrane is necrosed there is but a very thin partition between the intestine and the peritoneal cavity, and one of the great risks is that these ulcers shall extend so far that rupture of the peritoneal coat of the bowel will occur.

The dietary, therefore, must be exceedingly soft and unirritating, and the best diets are milk, thin broths, sometimes a little farinaceous food, such as arrow-root, but not very much, the chief articles of diet being milk and animal broth, and no solid food of any kind. But be careful with respect to the use of milk, because milk is a strong food; it has been said that a pint of milk is equal to a mutton-chop, and therefore you must not prescribe undue supplies of milk for a patient, because he does not require it. The diet for all febrile states is mainly milk and beef-tea. In a state of fever the salivary glands, the pancreas, and other glands which take part especially in the digestion of starchy food do not perform their functions properly. The very presence of fever diminishes their functional power, and therefore the digestion of starchy food becomes a little difficult; but still you can use a little of it. You trust mainly to milk, but with one precaution. Milk, during the process of digestion, becomes converted into curds,

and the curds of the milk, passing down the intestines, become hard, or even bulky, and so may greatly irritate the ulcerated surfaces. Sometimes a great deal of trouble in enteric fever is due to the undigested curds of milk. To avoid that, you may add to the milk one-fourth, and sometimes a half (if the milk is very good), of lime-water, which prevents the curds becoming large, and allows the milk to curdle slowly into small granular particles, and to be much better digested. This plan is of further advantage in partly checking the tendency to looseness of the bowels, which is one of the most prominent symptoms in enteric fever.

With respect to animal broths, it does not matter very much which you use, but it is found as a matter of experience that beef-tea is rather more apt to irritate the bowels than mutton-tea or chicken-tea,—that is, any animal broth except beef-tea is preferable if there is much diarrhoea. Some cases are accompanied by constipation all through the attack, and in such cases it would not matter whether you used beef-tea or any other animal broth. The thirst should be quenched freely with water that can be depended upon. Water of doubtful character must first be sterilized by boiling. Milk, too, may be sterilized if you are not sure of the source of it, and in many cases there is great reason to be doubtful of it. Especially is this the case in India, where the water-supply is generally contaminated, and where the milk-supply also is not dependable. You cannot trust the natives of tropical countries, who, of course, have no conception of what we mean by hygienic precautions, and therefore in India especially you have to protect yourselves against what may be their well-meaning ignorance.

Take great care in typhoid fever to give your patient no fruit. You will not find that precaution laid down in many of the text-books. Some authorities, indeed, think that some fruits are valuable, and they speak of giving the patient lime-juice, or say that a few grapes are very innocent things, taking care to remove the skin and the stones. A few grapes are not innocent; the pulp of grapes is very bad; you cannot trust your fever patient to masticate it sufficiently to render it harmless. Apart from that, the juices of fruit often have a disturbing effect upon the bowels, and such agents may turn the scale by increasing the diarrhoea and so damage your patient. Therefore not even lemons in any form, nor lemonade. I lay great stress upon this. I dare say the patient will get very sick of the dietary you enjoin, and very often he does. You cannot help that; your business is not merely to please your patient, but to get him well. There is one thing more which you can use, upon which stress is laid by some authorities, and

that is granulated malt, diluted with water or with milk, which makes it a very palatable and nourishing food for the typhoid patient. It is said that Eberth's bacillus flourishes luxuriantly in milk, and that it will hardly flourish at all in malt extracts. There may be something in that ; but we must not be too much influenced by theoretical considerations of that kind. We have the broad fact before us that the great mass of patients who have typhoid fever are fed on milk, and practically do very well on it.

Finally, you have to consider the treatment of the various prominent symptoms which occur in the course of the disease. I mention first, headache, which is sometimes very troublesome. This trouble may be relieved by a bag of ice applied to the forehead, or sometimes by very hot sponging. Such headaches as are not relieved by cold are often remarkably benefited by heat. In typhus fever, which used to be confounded with this disease until about forty years ago, headache is an exceedingly prominent symptom, and in this fever hot sponging was found to be preferable, and gave greater relief than cold applications. For the restlessness and the bad nights that may occur during the first two weeks of the fever it is a good rule not to employ opiates. You can secure all you want by doses of bromide of potassium or of *cannabis indica* ; either of these in proper doses, or combined in the form of bromidia, is suitable for the restlessness and sleeplessness. Attention should be paid to the state of the mouth, which is clammy, crusted, and sometimes exceedingly foul. It should be swabbed out with some antiseptic, such as a strong solution of borax. In this manner you may get rid of a great deal of foul matter containing the bacillus, which goes on poisoning the system, and, in particular, you avoid the possibility of otitis being induced by the toxins of the bacillus passing along the Eustachian tube. Diarrhœa sometimes is a prominent symptom, and sometimes a severe and dangerous one. As a rule, one is safe in leaving the patient alone, and not treating it, provided there are not more than three or four stools a day ; if they reach five or more it is well to employ some means of restraining them. The best thing to do is either to give a small enema of starch containing a little laudanum, ten to fifteen minims, in the rectum, or to give ten or fifteen minims of laudanum by the mouth at bedtime.

Now, what is the medicine for typhoid fever? There is no drug you can give with any hope of doing special good ; therefore we restrict ourselves to the use of dilute hydrochloric acid, in doses of ten to twelve minims every four or six hours, with a little peppermint-water, to which in the third week of the disease you may add, if you like,

half a grain of hydrochlorate of quinine, which makes a very suitable mixture. Indeed, this mixture is slightly antiseptic and somewhat tonic. It is a medicine which can do no harm, and in all probability will be of some use. Dilute sulphuric acid may be used in the same way, especially if diarrhoea is a troublesome symptom. Another remedy is bismuth, and we use most of the salts of bismuth, especially the carbonate or the salicylate, in doses of ten to fifteen grains three or four times daily.

All through the treatment the object is to maintain the patient's strength. Feed sufficiently, but don't overfeed. The special object is to maintain the strength of the heart, to help the patient through his troubles, which, observe, are always increasing as the disease progresses. The worst thing about enteric fever is that the patient has to pull through the greatest difficulties and complications at a time when he is least able to do so. The process of ulceration increases, and the patient becomes weaker towards the end of the disease, from the 21st to the 25th day. He is worn out by continued fever, exhausted by diarrhoea. At this period there is a great call for nourishment to keep up the strength of his heart, and to maintain a healthy process round the intestinal ulcers. That is why enteric fever is such a dangerous disease, even under the most favorable circumstances. But if you remember that fact, it will go a long way towards meeting the special difficulties of it. Remember, then, that the strength must be maintained, and the heart kept working steadily. You gauge the condition of the patient very much by the state of the heart and pulse from day to day. If the patient becomes weaker, his pulse grows weaker, smaller in volume, less in arterial pressure, and it may become double, or dicrotic. The heart-sounds become enfeebled, and the first one almost inaudible at the base. That constitutes what is known as Stokes's indication for wine or stimulants.

Another symptom that is apt to come on towards the close of the disease is swelling of the abdomen,—a condition called tympanites, a sign of general debility, nervousness, and exhaustion. It does not merely mean that the intestines are blown up and distended,—they often are,—but it also means that their muscular fibres cannot contract upon their contents, as they are relaxed and powerless. The muscular tone, and the nervous tone which inspires it, are both at a low ebb, and this is an indication that the powers of life require some fillip and invigoration. This stimulation may easily be secured by alcohol. When these conditions arise, your patient must have some stimulant. If some days before the belly is blown up, the pulse becomes soft, you

must employ some stimulant, and you thus anticipate further signs of weakness coming on, and so help the patient on towards the great ordeal of his illness, at the end of the third week. But don't begin the stimulants a moment before they are wanted. It is quite wrong to say that every case of typhoid fever requires to be stimulated. Some young patients, smitten with typhoid fever, may go all through their illness without a single tablespoonful of brandy. I frequently see such cases, and am quite prepared to meet with them. Other people, again, cannot go through their illness without a very large quantity of stimulants. You may want eight, ten, twelve, or even twenty ounces of brandy a day. You never know how any case is going to turn out. Do not "tie your hands," as some foolish people do, and say, "I never give stimulants in typhoid fever." When I hear a man say that, I know that I have not an experienced practitioner to deal with. He has tied his hands, and is helpless in the difficulties that may be waiting for him, and he may lose his patient. No fixed alcohol rule, therefore; you don't know how much you may want, but you must use what is demanded,—that is, what your skill and knowledge tell you is needed. Of course, you must not over-stimulate the patient.

Well, what are you going to stimulate him with? If you take my advice, with nothing but pure spirit,—no wine. Just as you can give no fruit in enteric fever, so you will do well, as a rule, to give no wine. It is quite conceivable that under certain circumstances some patient might be benefited by a little good wine, but before I would use it I should require to be satisfied that it was good wine, very old, and very sound wine. But to call for "wine" in the ordinary sense of the word, not knowing what it is or where it comes from, I should consider in many cases would be practically putting my patient in danger. Not even champagne, so called. It may be very grateful, and the patient might like it, but it is not safe, because it is much more likely to upset the action of the bowels than plain, simple spirit. Make it a rule, then, unless you are very sure of what you have to deal with, to use only pure spirit, such as brandy or whiskey. And you will begin with a couple of ounces,—perhaps less,—one, two, three, or four, according to circumstances. I should say that an average quantity for a bad case would be some three or four ounces. The amount should seldom exceed that, although six, or eight, or even more may be requisite, but those amounts are exceptional. I followed the practice here for many years of one of the shrewdest and most careful of physicians,—Dr. Andrew,—whose success was very great in these and many other cases, and he insisted in employing spirit rather

than wine in enteric fever, and I learned to see the full wisdom of his recommendations in that respect, and I have followed him in it, and have been thoroughly satisfied with the safety of the practice, and I confidently recommend it to you.

If, however, the tympanites, which always indicates weakness, is not relieved by proper feeding and stimulants, a good plan is to pass a soft India-rubber tube into the rectum, which will often liberate a quantity of gas and relieve the distention. Turpentine stupes have been recommended; I have seen them used, but have never seen any good come from the practice. Another plan which has been advised is to give charcoal in tablespoonful doses. I only mention that to condemn it most utterly. It is ineffectual, and is apt to lodge as foreign matter in the ulcers of the bowels. When there is great nervous exhaustion, I advise the use of full doses of Hoffmann's anodyne and drachm doses of tincture of musk every two hours. Hypodermic injections of strychnine are sometimes most useful, and distinctly save life in grave cases.

In some cases constipation is a troublesome symptom all through the disease, and you should always examine the patient's abdomen and ascertain the condition of the sigmoid flexure. A daily exploration of the belly is one of the greatest indications as to the progress of the case, and you should ascertain the general distention of it, and therefore the degree of nervous power possessed by the patient. You also want to know whether the spleen continues to be large, or is becoming smaller, as it should do when the disorder is passing away. Lumps of fecal matter in the sigmoid flexure, if retained, are apt to produce sudden accessions of temperature, which you cannot otherwise account for. Sometimes the patient is apparently going on well, but the temperature is going up. You fear a relapse and further involvement for another three weeks, but this trouble will frequently be explained by finding lumps in the sigmoid flexure. Give an enema of gruel, or soap and water, and the patient goes on well. Then comes the great question of purgatives from above. The rule is, never give them if you can possibly help it. Wash out the bowel from below, and wait for a natural action. If you are in doubt about giving a purgative from above, don't give it.

Another grave feature is intestinal bleeding,—bleeding from the ulcers. There are two periods at which this may occur, which are described respectively as “early” and “late” hemorrhage. Early hemorrhage takes place when the ulcerations have hardly begun, when the swollen patches become hyperæmically congested; so the vessels

break, and oozing of small quantities of blood occurs. "Early" hemorrhage is practically of no consequence, and need not be treated. The "late" hemorrhage, which occurs about the twenty-first day, when the sloughs are separating from the ulcers, is the most serious, and is a very frequent cause of death. You may find a small hemorrhage,—an ounce or so,—or there may be a pint or two, or there may be hemorrhage again and again until the patient is blanched, and death may result. That is a most serious and dangerous complication, and when that symptom occurs withhold all milk, even milk and water. Give nothing except simple bland fluids, such as beef essence, mutton essence, barley-water, and alum-whey. I recommend the latter to your attention. To a pint of boiled milk a teaspoonful of powdered alum is added. You strain off the whey and administer that. It is an astringent, and certainly feeds the patient. But it is not enough: you want to keep the bowels perfectly at rest when there is any risk of hemorrhage; you want to stop all peristaltic action if you can; and the best drug for that is opium, the only one we know for the purpose. Some of our American brethren express the condition we induce by giving the patient opium as "putting a splint" on the bowels. But you must use it freely, and so as not to disturb the stomach; you therefore give it by the rectum. In these cases you must administer thirty or forty minims of laudanum in an ounce of gruel or thin starch-decoction, and that has a marvellous effect in quieting the whole length of the alimentary canal, and puts the patient to sleep. You are advised to give a variety of other remedies, but I do not think you need any of them, or any other astringent. Anything that opium cannot do I do not believe any other drug can do.

Heart-failure as a symptom you should meet by giving alcohol. If delirium sets in, it is a sign that the patient is starving and is low, and that means a little more food and brandy. Sometimes the patient has tremors. Tremors affecting the limbs and the jaw and tympanites commonly occur together, and mean that a little more sustaining food and stimulant are wanted. You may have to increase the stimulants as time goes on. There may be some degree of albuminuria; it is generally symptomatic, but not serious, and will pass off as the patient gets well.

There may be excessive temperature,—hyperpyrexia. That is a serious symptom. A great many measures have been recommended for overcoming this. A temperature of 104° F. may be looked upon as favorable. I regard such moderate temperatures as helpful, and as a way out of the trouble. Of course, if the pyrexia increases it will

certainly damage the integrity of the several viscera. Anything above 104° means that a cooling-down process is necessary, and our rule is to put a cradle on the bed and a sheet over that, so as to allow a current of air to pass over the patient. If the temperature still rises in spite of the cradle, then the patient is sponged with ice-water, which is a powerful reducer of temperature. If that also fails, bags of ice are suspended from the top of the cradle, and a Leiter's cap is put on the head. In the great majority of cases these measures, or some of them, are sufficient. The method of bathing typhoid-fever patients is much in vogue in Germany and in some other countries. We formerly tried it here. We found it was not necessary to do it, and we can generally safely dispense with it. The other day, in a great hospital in New York, where they have plenty of money and a large staff to carry out this plan, I learned that every typhoid-fever patient is bathed systematically, and I told the physicians I did not think it was necessary, that we did not use it, and that I was not aware that our statistics of recovery in this hospital were less satisfactory than theirs.

The most grave complication, next to late hemorrhage, is that of perforation of the ulcerated bowel at some point. This is always a possible danger when there is deep ulceration, and the patient is of feeble constitution and has been imperfectly nourished during the course of the fever. General peritonitis rapidly sets in, the bacterium coli is set free, and a fatal ending is certain. Improper feeding with fruit or crude matters has often led to this untoward result. I once saw a piece of orange-pulp extrude from a ruptured ulcer, and this proved, of course, fatal. An orange had been furtively given by a relative to the patient, in defiance of warning and supervision, during a visit.

You can do little for this complication. It is usual to give opium freely, and to try to secure a limitation to the spread of peritonitis. But such adhesions as form in these conditions generally prove too frail and inadequate to secure a closure of the breach thus made. The bold measures of modern aseptic surgery are little likely to prove of avail, even if they be practised, and the abdomen be opened and washed out. The patient is at the lowest ebb, exhausted by prolonged fever, and in the worst possible condition to bear any operative interference. Prevention, and not cure, is the only available way open to us. What these methods are I have already indicated to you.

The patient may at last become the victim of pyæmia, owing to a multiplicity of germs, each working out their own specific processes in the body. Such cases are generally fatal.

An important question is, of course, when will it be advisable to return to the normal diet. That requires a great deal of clinical skill to determine. The rule is that you should wait until the fever has gone, and has been gone for some days, and then you may gradually mend the diet and give a little slightly solid food. You should begin with bread-and-milk pap, with custard, then pass on to fish, next to very lightly boiled eggs, then to pounded meat, and so on, gradually feeling your way, and watching the effect of what you are giving. It is better to be a few days late in mending the diet than five minutes too soon, because, without doubt, relapses have been caused by giving solid food too soon, the effect being to open up the ulcers, to liberate new germs remaining latent in the system often for months after the fever. You never are quite sure when you have got rid of them. Hence some of the troublesome sequels, often very late, which occur in cases of enteric fever.

Some of these remarks may appear to you rather trifling ; but the safe conduct of sick people largely depends, as you will find when you come to practise your profession, upon attention to small matters. Attention to them or neglect of them may turn the scale in favor of life or death.

SPEECH WITHOUT A LARYNX; THE TREATMENT OF ASTHMA AND EMPHYSEMA; DILATATION OF THE HEART.

CLINICAL LECTURE DELIVERED AT THE PHILADELPHIA HOSPITAL.

BY SOLOMON SOLIS-COHEN, A.M., M.D.,

Professor of Therapeutics and Clinical Medicine in the Philadelphia Polyclinic;
Lecturer on Clinical Medicine at Jefferson Medical College; Physician
to the Philadelphia and Rush Hospitals, etc.

SPEECH WITHOUT A LARYNX.

GENTLEMEN,—The patient that I have here is a very remarkable case (CASE I.). His name is Daniel Hickey, and he states that he is forty-eight years of age. I shall ask him to repeat his name and age, and count as far as he can go without stopping for breath. He counts to nine. The members of the class seated on the top benches tell us that they hear him distinctly. You will wish to know what there is remarkable in the fact that this man can speak with sufficient clearness and force to be heard by those sitting on the far benches in this good-sized lecture-room. Before telling you I should like to ask a question. With what structures does this man produce vocal sounds? You answer, "With the vocal cords of the larynx!" It is true, no doubt, that he phonates by means of his vocal cords, or, as I prefer to call them, vocal bands; and one's vocal bands are, ordinarily, a part of his larynx, but this man has no larynx. He was born with one, as men usually are, but it is now reposing quietly in a jar of alcohol in the Pathological Museum at Jefferson Medical College. Neither has he, as have some persons whose larynges have been excised, an artificial substitute. He speaks without a larynx, by means of a substituted vocal organ provided not by art but by nature. I shall tell you his history.

He had an adeno-carcinoma of the larynx, involving the vocal bands and a portion of the thyroid cartilage. This developed upon the site of a tumor which had been removed some seventeen years before by Dr. Lefferts, of New York, and which was examined microscopically, and proved to be a papilloma. Seventeen years later a

growth was discovered at the same point, and was at first supposed to be a recurrent papilloma. It increased very rapidly, however, and the patient applied to my brother, Dr. J. Solis-Cohen, who removed it by operation through the mouth before his class at the Jefferson Medical College Hospital. Dr. Cohen believed that this growth was malignant in character on account of its rapid development and its macroscopic appearances, but a portion of it was examined microscopically, and the microscopist was unable to say whether it was malignant or not. Its rapid recurrence after removal and its continued spread were, however, sufficient clinical evidence of its malignancy, and a radical operation was determined upon. The only operation possible was the extirpation of the entire larynx,—complete laryngectomy. As a preliminary to this, a tracheotomy was performed. After the patient had recovered from the tracheotomy and the parts had quieted down, a complete extirpation of the larynx was performed by Dr. J. Solis-Cohen, before the class at Jefferson Medical College Hospital. In this operation Dr. Cohen had the valuable assistance of Drs. Keen and Horwitz. A T-shaped incision was made where you see the scar, and the larynx carefully dissected away and brought out through the wound. The epiglottis, which was healthy, was left in place, the larynx being cut away from the epiglottis. It was then cut off from the trachea at about the second ring, just above the place where the tracheotomy wound had been made. The top of the trachea, whence the larynx had been cut off, was brought forward and stitched to the tissues outside, thus effectually preventing, what is usually the most fatal complication in these cases, and from which many patients have died within the first two weeks after the operation, infectious pneumonia, through the entrance of food into the lungs. By the method described, a suggestion of Professor W. S. Forbes, of Jefferson Medical College, this mischance was entirely prevented. Very little dressing was applied. At first the wound was covered with gauze, and a rubber tube was inserted into the œsophagus, to be used for feeding. Afterwards, on the second or third day, the tube was removed and the parts allowed to heal. The larynx being gone, and the pharynx being left intact, food went down the natural way without any danger of its entrance into the lung, and therefore this man was saved from pneumonia.

Now, the remarkable part of this case is this: our patient had been in the hospital about eight months when he got angry one day with one of the nurses. He tried to tell what was the matter, but he could not do this, and could only make an inarticulate noise. Dr. Cohen encouraged him to proceed and make more noise, and finally

after some little effort and training on his part he has developed the voice that you hear. His organs of articulation, the tongue, lips, teeth, palate, were, as you understand, not interfered with by the operation; but in the absence of a vocal sound to modify, the articulatory organs cannot be used for speech. Given phonation, articulation proceeds as usual. Nature developed for this man a new means of phonation. He now counts for us seven in a voice loud enough to be heard at the furthest benches, after drawing one breath. The question is, Whence does he get the air that is necessary for this purpose? Sound is produced by something being set in vibration, and in turn making the air vibrate. To produce the vocal sounds, a current of air must strike the vocal bands, setting them into vibration like the reed of an organ-pipe. If you watch this man closely when he talks you will notice that the tissues just above this wound in the neck bulge out. If I press with my finger on this projection it immediately stops the voice. He swallows air, which accumulates in this pouch, which has become developed in the tissues, and the amount of air thus swallowed is sufficient to last long enough for him to count seven or eight or nine. This is on the principle of a Scotch bag-pipe. Our patient has a little bag from which the air is expelled. Now, what is it that the air sets into vibration? We thought the folds of the constrictor muscle of the pharynx were utilized. A recent study, however, shows some thickening of the mucous membrane at the bottom of the pharynx, somewhat above the former situation of the normal vocal bands, behind the epiglottis. These perform the function of the original vocal bands,—in other words, he has pharyngeal vocal bands instead of laryngeal vocal bands. He first swallows the air into this little pouch, and then expels it, setting these two new-formed vocal bands into vibration. This case illustrates very well the Lamarckian theory of evolution, the one which was in vogue prior to the time of Darwin. Darwin laid great stress upon natural selection through a process which Spencer has very aptly termed “the survival of the fittest.” The theory is, that, accidentally—that is to say without traceable cause—certain variations in structure occur in animals; those variations fitting them for certain conditions of the environment. The animals having these variations best developed will survive more readily than those that have not, and will transmit the variations to their progeny, so that by degrees nature, taking advantage of these variations, develops a new variety and finally a new species of animal. Lamarck, however, held that the effort of an animal to perform some function would develop variations in its structure, which would then become intensified through transmission

and increased effort throughout successive generations. It is a mistake to suppose that Darwin was the originator of the theory of gradual evolution in animal forms. He was the one that established it by means of profound thought and patient labor, and his is the great and lasting credit, but it had been previously suggested as far back as scientific thought reaches. Among those that preceded Darwin was Lamarck, who, as I have said, held that the effort of an animal to perform a function developed a structure in obedience to that effort—and here is an illustration. The effort of this man to speak has taken advantage of some little fold in his pharynx, and by continuous effort the structure has finally been developed into what, I may say, you hear. This man was operated on April 1, 1892, and there is no sign of recurrence, so that it is a very successful case. I am glad to have had an opportunity of showing it to you to-day, as the probabilities are that most of you will not see its mate; it is not likely that more than one or two of those present will ever perform a laryngectomy.

STRYCHNINE AND QUEBRACHO IN THE TREATMENT OF ASTHMA.

CASE II.—The next case is one of therapeutic interest. Hickey's case was of some pathologic and scientific interest, but not so much of therapeutic interest at present. John Boyd has for a long time—*i.e.*, for over a year—suffered from shortness of breath, which has been much worse at night, and he has had to sit up to get breath. The paroxysms sometimes occur two and three times in a night and sometimes not more than once. In each of these attacks, which come on suddenly, waking him, there has been considerable wheezing which could be heard at some distance, so that we have a typical case of asthma. On percussion of the chest it is quite evident to my ear, although I do not know whether or not the class can hear it, that there is hyperresonance. This is very marked at both apices, and also in the axilla. You will observe that the clear note is also heard over the normal site of liver dulness. There is some dulness on the right side posteriorly at the base. You will note the shape of the chest. You will also notice the exaggerated fixed expansion of the lower portion of the chest. In breathing you will notice the peculiar motion, which is up and down, instead of being expansive at the sides. What does this signify before auscultation? Too much air in the lung. Very little air goes into the chest, on account of the large amount that is there already. This may be accounted for by dilatation of the air-vesicles. Auscultation gives us prolonged expiration and rough breathing. The diagnosis is simple emphy-

sema,—dilatation of the air-vesicles with probable rupture of the septa between them. The difference between this and the condition we try to bring about by pneumatic treatment in consumption is that in this the interlobular septa are ruptured. The air-vesicles are not simply distended to their fullest extent, but, as I have said, the interlobular septa are ruptured. This means that the little capillaries which run over the septa on the surface are wiped out of existence, and that means that the blood cannot be fully aërated, because the manner in which the blood becomes aërated is through the enormous capillary surface which is spread out through the lungs. The blood failing to become properly aërated, the patient has a continuous feeling of dyspnœa. In addition to this he has paroxysms of suffocation. This is not a case of simple spasmodic asthma in which there are periods of relief, the spasm coming on and going off for a time, constricting the bronchioles and then relaxing and allowing the air to enter. We have here a continuous condition. A portion of the blood-canal is destroyed, entirely preventing aëration of a portion of the blood. In addition to this, the enormous dilatation of the vessels prevents the entrance and exit of air. The greater portion of the air stands still and the exchange of gases, elimination of carbon dioxide and absorption of oxygen, is greatly diminished. The permanent condition is, of course, not amenable to therapeutic relief. We cannot create new septa; we cannot create new capillaries, and we cannot force the weakened, thinned-out tissues, which have lost their elasticity, to contract. Therefore, so far as the dyspnœa depends upon permanent pathological conditions we cannot greatly relieve it; expiration into rarefied air gives temporary relief by permitting greater pulmonary ventilation. But this man has also temporary exacerbations of dyspnœa caused by the spasmodic condition, and these we have tried to relieve. That result we have accomplished in a measurable degree by two agents,—strychnine and quebracho. We have used them singly and in conjunction. The fluid extract of quebracho in drachm doses, every two hours, continued for several days, has at times afforded relief, and when this has failed, we have stopped it and given him strychnine sulphate, one-thirtieth grain hypodermically when needed. This has promptly controlled the paroxysms. We have also used nitro-glycerin, amyl nitrite, or sodium nitrite for temporary purposes. The doses are always pushed to the point of tolerance in order to get the proper therapeutic effect. From among these agents we choose in accordance with the rapidity or permanency of the effect which we desire to produce. Amyl nitrite acts most rapidly and the effect passes away most

rapidly. It is measured by minutes. Nitro-glycerin acts less rapidly, but its effect lasts a little longer. The effect does not last more than from half an hour to two hours. Sodium nitrite acts more slowly than either of these two, but the effect lasts longer. In a case of asthma, then, in which we want to produce a somewhat lasting effect, we use the sodium nitrite, beginning with one-fifth of a grain three times a day, and increasing the dose daily by one-fifth of a grain until we may reach fifteen grains in a day. This is a large dose and should be approached only by degrees, as I have stated. Begin always with one-fifth of a grain and push to the point of tolerance. In cases of uræmia, in which we want to produce the effect rather rapidly, we resort to nitro-glycerin, either hypodermically or by the mouth. In the paroxysms of angina pectoris, in cases of actual coma, convulsion, collapse, asphyxia, or in any urgent condition of this kind, whether uræmia or pneumonia, or whatever pathological state may have brought it about, we resort to inhalations of amyl nitrite, which drug, when applied to the nose, is absorbed directly through the nasal mucous membrane. It requires no consciousness on the part of the patient. It proceeds at once to the brain, and exerts its relaxing effect there. I have seen patients practically snatched from the jaws of death by the application of amyl nitrite to the nostril. We simply uncork the bottle and nature does the rest. We hold the bottle to the nose, if we are in a great hurry; but, if we have a little time, we pour a few drops—five or ten—on a handkerchief or wad of cotton and hold it to the nose. Patients suffering with angina pectoris or other condition that renders them liable to sudden vascular and cardiac spasm, and to heart failure, often carry with them pearls of amyl nitrite, and on the first pain they crush one of these pearls in a handkerchief, and hold it to the nostril. Thus life may often be saved; but sometimes death occurs, to use a colloquial phrase, “in almost no time,” even before the patient can get this remedy. I have recently heard of such an instance in the case of a physician, who died in a paroxysm of angina immediately after his medical attendant had left his bedside. Nitro-glycerin, or as some prefer sodium nitrite, should always be administered continuously to patients with angina pectoris. I should not like a patient with any of these dangerous spasmodic diseases to be at any time entirely free from the influence of the nitrites, although it would not be advisable to keep him continuously under their full influence. To return to the consideration of asthma, apart from the nitrites, strychnine has been more useful in controlling and preventing the attack than any other drug I know of. A very useful measure in cases of uncom-

plicated asthma is to give a hypodermic injection of atropine, one-sixtieth grain, and strychnine, one-fortieth grain. This treatment, first advised by my friend and colleague, Dr. Thomas J. Mays, will often cut short the asthmatic paroxysm. There is one patient under my care who has suffered from asthmatic attacks for years, on whom I used this remedy with great success. Three injections upon successive days gave the patient relief for a year. He then returned to my office, having had an attack the night previous, and two injections gave him relief for two years. He then returned again with another attack, and one injection gave him relief for three years. This series of injections and attacks exhibits a very curious mathematical relationship. I lay no stress upon the formula, but I relate this incident to illustrate the apparent efficacy of the treatment in that case. The earlier in an attack the injection can be made the greater is the chance of its cutting the attack short.

EXCESSIVE CARDIAC DILATATION WITH COMPLICATIONS.

CASE III.—The next patient, Anthony Jones, says he is sixty-seven years of age, was born in New York, and is a laborer. One of his sisters died of dropsy. There has been tuberculosis in the family. His mother and maternal grandmother suffered from rheumatism, but otherwise the family history is negative. He had the ordinary diseases of childhood. His initial lesion of syphilis was obtained thirty years ago, and he had swamp fever ten years ago. About this time he was told that he had heart-disease, and since then he has been getting gradually worse. He states that he uses tobacco and alcohol to excess. He has a right inguinal hernia. Five years ago he had rheumatism, and his present trouble dates from two weeks prior to February 17, the day of his admission. At that time he caught cold, and has since suffered from shortness of breath. He complains of some pain at the lower border of the chest. The feet and ankles are swollen, and the face is slightly puffed out. The urine has a specific gravity of 1015, and contains albumen and granular tube casts. You will note this complication of diseases. This is the kind of patient that we have so frequently in these wards, and in whom our therapeutics cannot be very promising on account of the great complication. We often give them considerable relief, however, that is if we do not give them too many medicines. We do not need to give a separate drug for every separate ill. We try to find the one drug that meets all the indications, and if we cannot do this we find the one that meets the more prominent indications. In this case the heart is jerky, rapid,

and irregular. The apex beat is in the nipple line, but the nipple is rather more to the left than usual, so that the apex beat is much to the left of the normal position and is in the sixth interspace. It is rather lower than it should be. Cardiac dulness is quite marked as high as the third interspace, and it extends to the right of the sternum. The outline is irregularly quadrilateral. At the apex the first sound is replaced by a soft, blowing murmur, and this murmur is transmitted into the axilla and is heard behind the scapula. The second sound is feebly heard at the apex. At the aortic cartilage there is a rough sound with the systole, a blowing sound with the beginning of the diastole, and a faint closure sound of the valves. At the pulmonary cartilage there is a rumbling sound and a faint closure sound, and in the vessels of the neck there is a musical hum. A venous thrill is feebly felt above the clavicle, but there is no thrill below the clavicle. The aorta is felt to pulsate excitedly but feebly just behind the sternal notch. Remember that there is a difference between excitement and strength. Sometimes we mistake an excited action for a strong action in the heart or vessels. The pulse is tense but feeble. The arteries are rigid and the pulse-rate is 108. You will notice that the vessels of the forehead and the temporal arteries are rigid and tortuous. You will notice also the pulsation in the neck and above the clavicle on each side, and also the pulsation at the bend of the elbow. I have no doubt that if we examined the foot we could notice the pulsation of the dorsalis pedis. The patient passes plenty of water and has very little pain. We must examine the lungs. Pulmonary resonance is irregular,—that is to say, there are scattered areas of dulness. Sibilant or sonorous râles are not detected, but there are some subcrepitant râles scattered irregularly over both sides. Now, what is the diagnosis in this case? He has mitral regurgitation and aortic obstruction and regurgitation, as correctly stated by one of the class; possibly tricuspid regurgitation also, as another member of the class suggests, for all of the cardiac valves are probably in bad condition, but we have no positive evidence of right-sided valvular lesions.

I should like to hear something about the heart-muscle. The answer "dilated hypertrophy" expresses the facts. The cardiac muscle is both enlarged by hyperplasia and stretched by distention, and we are dealing with a weak cardiac muscle and a heart that is very much enlarged.

I shall draw for you on the black-board two outlines of enlarged areas of cardiac dulness that may be found in cases of similar symptomatology but different pathology; the one representing cardiac dila-

tation and the other pericardial effusion. There is usually a pyramidal or triangular outline of dulness in pericardial effusion. The diagram of dilatation is irregularly quadrilateral. There may be pleural effusions and other conditions that obscure the præcordial dulness. In some cases you may possibly be in doubt whether you are dealing with a dilated heart or with a pericardial effusion, as in both cases you will have this enlarged area; the heart sounds will also be feeble and somewhat muffled. I have known cases of pericardial effusion to be mistaken for cases of dilated heart, and *vice versa*. Attention to small points like these may sometimes help you. This man has atheromatous arteries, an interstitial nephritis, and possibly a parenchymatous nephritis too. He says he has had rheumatism, which indicates a fibroid diathesis which may give rise to the kidney trouble. I do not know whether the heart lesion is secondary to the kidney lesion or not. As a rule, in cases like this the heart lesion is secondary to the kidney lesion, but here we have valvular lesion, which will account for the stretching of the heart without the kidney complication. The probabilities are that the kidney complication has increased the dilatation of the heart.

The treatment must be directed to the cardiac muscle, and the first principle is rest in bed. I am glad to say that the patient I showed you last week has steadily improved, and he has had no treatment but rest in bed. This man will be purged, to relieve his heart and vessels of some of the weight they carry, and this will be repeated as indicated. Having to deal with a damaged muscle and very much damaged valves, it is necessary to give the patient some cardiac medicament. What shall it be? Strychnine and nitro-glycerin are suggested by members of the class. Strychnine would be excellent, and nitro-glycerin might also have good effect, but the very best of all is yet to be mentioned. Some one correctly says, Digitalis. Here is a case in which it is proper to give digitalis. Digitalis is prescribed time and again when it should not be prescribed, but in this case it is indicated. We shall place this patient upon a mixture of the infusion and the tincture of digitalis. As you know, some of the active principles of digitalis are soluble in water and others in alcohol. The infusion represents the watery solution and the tincture represents the alcoholic solution. To obtain the full benefit of both we shall give him, night and morning, of the infusion of digitalis one-half fluidounce, to which will be added five drops of the tincture of digitalis. In addition to this and the rest in bed, his diet will be regulated, and purging will be kept up from time to time as is necessary. At the next clinic I hope to report that his condition has improved.

AORTIC ANEURISM; A CASE OF TUMOR WITHIN THE THORAX; REMARKS ON ANEURISM OF THE AORTA AND ITS TREATMENT.

CLINICAL LECTURE DELIVERED AT THE BERLIN POLYCLINIC.

BY M. LITTEN, M.D.,

Professor (Extraordinary) of Medicine in the University of Berlin.¹

GENTLEMEN,—This patient's case is not a common one, and requires particularly careful examination. She is thirty-nine years old, married, and has two children. Neither the family history nor her own present any features worthy of note; I shall not trouble you, therefore, with the details. Two years ago she commenced to complain of intermittent pains in her left shoulder and arm. In course of time this grew worse and the pain extended to her chest. The general health suffered. She now sleeps badly. When she makes any exertion, especially when she mounts a flight of stairs, this aggravates the pain, and she finds herself so much out of breath that she is obliged to take a long rest on each landing.

The first thing you notice on examining her is the way in which the cutaneous veins of the upper part of her chest are distended, more so on the left side than on the right. From this you may conclude that the veins within the thorax are likewise abnormally congested, and have been in that condition for a certain length of time, else the collateral circulation on the surface of the chest would not be encumbered, and the vessels distended to such a degree.

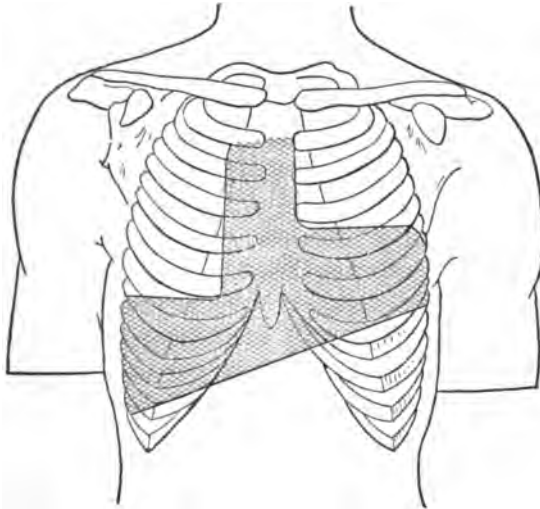
The next thing I wish to call your attention to is the difference between the right and the left pulse. On the left side it is pretty strong and full, whereas in the right radial artery you can hardly detect any pulsation; there was not enough to enable us to take sphygmographic tracings. Applying your hand to the left supraclavicular region you feel a very powerful fremitus; above the right clavicle there is merely a fine thrill, barely perceptible, becoming more evident as you lower

¹ Reported by H. Cleves-Symmes, M.D.

your hand and carry it across to the left; in fact, at the level of the second interspace you can make it out clear across the chest. You can even see this vibration, if you place the patient between yourself and the light and scan the profile, if I may call it so, of her chest. You notice it to be more marked on the left side.

Before proceeding to the physical examination you must not fail to notice the dilatation of the left pupil, indicative of irritation on the part of the sympathetic system on that side. We may conclude that this is due to compression of these nerves, when we take into consideration the pain in her arm, which is a symptom of pressure exer-

FIG. 1.



Area of increased cardiac dulness and transmitted valve-sounds in a case of aortic aneurism.

cised by the heart or the aorta either on the brachial plexus or on neighboring sympathetic nerve fibres. You will understand that I am referring to cases where, as in the present one, no local affection in the arm or in the shoulder-joint can be held accountable for the pain. When a patient consults you for pain in his shoulder, you must not be too ready with a diagnosis of rheumatism, but examine his heart each time. This is all the more important, as it is one of the earliest symptoms of the disease from which this patient is suffering. I may add that she also complains of pains during mastication, which are of a reflex nature, a kind of neurosis, whereof we are unable to determine the point of origin.

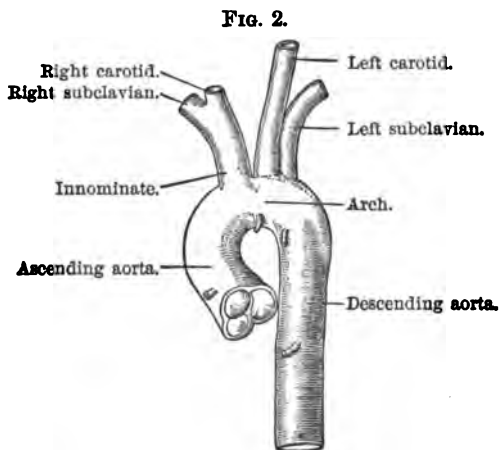
On examining the heart we find the impulse beat more extensive

than the normal, reaching as far as two inches external to the nipple line. It is diffuse and heaving, but no distinct purring tremor can be made out. An area of impaired percussion lies in front, and a considerable way to the right, of the sternum, going up as high as the second rib; this shows it to be due not to the right ventricle alone, but also to the aorta. To the left the area of dulness extends no farther than the apex-beat. (See Fig. 1.)

Our examination so far is sufficient to insure the presence of aneurism of the aorta; the variation in character of the pulse in the two radials directed our attention that way at the very outset, the large area of dulness over the aorta, associated with pulsation in the upper part of the chest, confirms the diagnosis. The systolic bruit over the aorta, not due to stenosis of the aortic valves because of the powerful pulsation over the aorta and the vigor of the right wrist pulse, and the symptoms of nerve compression agree with this view. This settled, we have to ascertain certain particulars as to the situation, size, and shape (sacculated or fusiform) of this aneurism.

The text-books, as a rule, say that the condition of the pulses will enable you to localize the disease. The pulse in the vessel branching off below the aneurism is said to be either weaker or behind time, owing to retardation of the blood-current within the wide sac. That is sound reasoning, but wrongly applied. First of all, there is no certain relation between the size of an aneurism and the diameter of its lumen. Generally a great amount of clotted blood adheres to the walls, frequently leaving a passage free for the blood-current of much the same diameter as the original vessel. Secondly, those who give this explanation must have no very clear conception of the anatomical configuration of the arch of the aorta and the vessels starting therefrom. These latter lie close together, the innominate approaching the left carotid, and the left subclavian touching it. I have generally in anatomical representations found the innominate and the carotid too far apart. This drawing (Fig. 2) will give you an idea of their real position, which you may verify at the next post-mortem you attend. It stands to reason that an aneurism, however small and distinctly sacculated, could never interpose between any two of these vessels. It may, and generally does, involve them in various manner and degree. In the case of vessels springing from the aneurism itself a projecting blood clot is apt to narrow the orifice. Much more often, though, we find another influence at work, which extends also to those adjoining vessels that are but indirectly connected with the diseased portion of the aorta,—I mean the drag on the neighboring parts and their dis-

location by the aneurism. I have repeatedly dissected the large vessels in such cases, particularly of aneurism of the innominate, where the pulse was smaller and belated in the left subclavian, and I have almost invariably found the vessels *on the opposite* side distorted, and their orifice sometimes reduced to a narrow slit; the entrance into the subclavian, as the more lateral of the two, is apt to exhibit greater deformity and narrowing. Where the aneurism lies more to the left, there the innominate is more likely to be the sufferer. Individual cases may of course present all kinds of variation, but in general you will find my statement of the matter to be correct. Occasionally, also, pressure of the sac on a vessel, or endarteritic changes about its orifice, are the cause of the pulse symptoms. In the present case, the



Relative position of the several blood-vessels given off from the arch of the aorta.

pulse on the right side being involved, we may surmise that there is a drag on the innominate artery (the pulse in the right carotid being likewise very weak), and that the aneurism accordingly embraces the inferior or concave aspect of the aorta and extends to the left, where the descending portion begins. The powerful thrill felt over the upper part of the chest on the left side gives support to our theory. It seems superfluous to mention—but it is a point one is apt to neglect—that when you found conclusions as to the aorta on the condition of the radial pulse, you must make sure of the absence of intervening local causes, such as thrombosis, embolus, a diseased condition of the walls of the artery, and last, though not least, an abnormal origin or course of the vessel.

The aneurismal enlargement, according to our diagnosis, not being

situate beyond (below) the left subclavian, we may expect the pulse in the femoral artery not to be later than the left radial. On examination I find my view corroborated, but at the same time I notice that the pulse in the groin is different in character from that at the left wrist; it is sudden and jerking, the characteristic water-hammer pulse of aortic regurgitation. This furnishes us with two more facts,—namely, that the aortic valves are prevented from properly closing, and that the aneurism involves also the vessels springing from the left of the arch of the aorta, else the radial and carotid pulse, on that side, would also present the features of aortic regurgitation.

By auscultation a loud systolic bruit is audible over the base of the heart and throughout the area overlying the aorta; it is loudest in the second interspace close to the right side of the sternum, whence it is conducted up to the jugular and downward as far as the fifth and sixth ribs. There is no second sound heard over the base of the heart, but in its stead a blowing diastolic murmur. Over the apex the first sound is normal in character and very loud, in the place of the second sound the aortic murmur is faintly heard, growing more distinct as you approach the base. There is no doubt, therefore, as to the presence of aortic regurgitation whereof the proximate effects are manifested by extreme hypertrophy of the left ventricle and corresponding heavy prolonged impulse. There is no reason for ascribing this patency of the aortic valves to organic disease; it is more in accord with experience, and simplifies the clinical picture, if we assume it to be due to functional inadequacy on the part of the valves, brought on by dilatation of the ostium in consequence of the aneurism having gradually crept up to the very threshold of the ventricle. It is possible, too, that the sclerotic process in the aorta has extended to the valves and disabled them, although our patient's sex and her comparatively youthful age do not render this likely.

Our diagnosis, then, finally amounts to this: aneurismal dilatation of the ascending and transverse arch of the aorta, with consequent aortic regurgitation and hypertrophy of the left ventricle. As to the systolic bruit heard over the aneurism, that is a very uncertain symptom due to varying mechanical conditions about the sac, the heart, or the vessels, and as often absent as not. The heart is not necessarily involved in aneurism, unless it be subject to extra strain,—that is to say, unless the aortic valves have become incompetent from one of the two causes just mentioned.

I shall have more to say on the subject of aneurism later on. In the mean while I wish to show you another patient presenting a similar

difference between the pulses at either wrist, although from another cause.

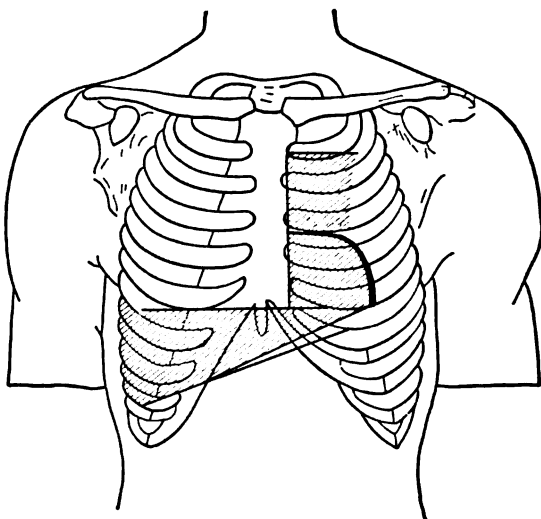
CASE II.—C. A., fifty-four years old, a widow, has enjoyed good health all her life up to within the last year. Her husband died of consumption ten years ago. She has no children, and she states that she has never suffered from venereal diseases. About a year ago she began to complain of shortness of breath, then gradually she got to feel as though a weight of lead were continually pressing on her chest. A slight effort would bring on an attack of stenocardia with considerable pain in her left arm; sometimes the latter occurred alone. When she keeps quite still the pain subsides. The subjective symptoms are a great deal more prominent in her case than they were in our first patient. There we had to elicit information by questioning, whereas here it is difficult to get her to talk about anything else, her words being intermingled with exclamations of pain and discomfort.

The face is cyanosed; the veins along the left side of the neck stand out like cords; the bulb of the jugular is prominent above the left sterno-clavicular joint. Œdema is not present. The urine is free from abnormal constituents. The pulse of the right radial artery corresponds in strength with that of the femoral, at the left wrist there is hardly any pulsation. In the first case it was just the reverse, the left pulse being stronger than the right one. Also a peculiar thrill is perceptible to the touch above the left clavicle; on the right side nothing of the kind can be felt.

On percussion we find no evidence of impairment over the sternum or to the right of it. On the left side, however, just above the heart, there is an area of dulness extending from the upper margin of the second rib down to the fourth rib. (See Fig. 3.) The respiratory rise of the chest is less marked on this side than on the right. Neither percussion nor auscultation reveals any abnormal features about the heart. In the second interspace on the right side over the semilunar valves the second sound is clear and pump-valve-like in character, but very weak. A loud systolic bruit is distributed all over the sternum, loudest over its upper part; it is also heard above the left clavicle, whereas the right carotid furnishes a clear second sound. The lungs also appear normal except the area of dulness, where the respiratory murmur is absent altogether. What is the cause of this dulness? I think we may safely exclude the heart without entering on explanations. Let us see whether any affection of the lungs may account for it. Pneumonic infiltration would be associated with bronchial respiration, the same would be the case in regard to a slight amount of pleuritic effusion; the underlying

lung being relaxed and the intervening layer of effused matter too thin to shut off the sound. A considerable effusion in this region, on the other hand, would not be met with as a circumscribed affection; here there are no signs of effusion elsewhere. Hemorrhagic infarction of the lung is excluded by the long duration of the trouble. The only thing then remaining is the presence of a *tumor within the chest*, originating either in the lungs or in the pleura, and interposed between the lung and the thoracic wall. This explains the dulness, the absence of respiratory murmur, the symptoms of vascular compression, and the long duration and steady progress. It is impossible to tell the size of

FIG. 8.



Area of cardiac and aortic dulness in a second case of aortic aneurism.

this new growth; we only know that it does not adjoin the walls to any large extent. It reaches backward as far as the aorta, compressing that vessel as well as the left subclavian and carotid. Compression of the aortic arch explains the systolic murmur, which is due to stenosis; you hear it loudest above the point compressed, whence it is transmitted along the aorta in either direction for a short distance. This causes the murmur over the whole surface of the sternum. The aortic valves have not suffered, that is proved by the presence of the second sound; its feebleness is owing to the elastic recoil of the aorta being broken where the vessel is compressed. Over the left carotid the aortic murmur changes to a more whizzing character. This addition of a new element of sound shows that the carotid is likewise com-

pressed at its origin. A further proof of this fact is furnished by its diminished pulse. The same condition exists in regard to the sub-clavian, but to a higher degree, the pulse and the murmur both being weaker. The innominate is not involved. This outline (Fig. 4) will show you what I mean; it is not meant to represent the actual aspect of the parts, as they are sure to be no longer normal in configuration and position.

The subject of to-day's lecture being aneurism of the aorta, I shall not discuss this case any further. I availed myself of the patient's opportune presence for the sake of differential diagnosis.

We will now consider the question of the *etiology* of aneurism. The disease is most frequent between forty and sixty years of age, the period during which arterio-sclerosis usually is developed.

This primary disease of the vessel walls, whereby the intima loses its elasticity and the media its tone, is the essential cause of aneurism. All the other reasons that have been assigned act on this basis, aggravating a mischief that has already been set on foot. I mention the abuse of alcohol and of tobacco; rheumatism; gout, particularly emphasized in England, where there is much more of it than with us in Germany; and syphilis, on which the French put much stress. Occasionally the mischief seems to be brought on by injury or shock to the chest. Not long ago I had a locomotive-engineer under my care whose chest was squeezed by a heavy door in a railway accident. An immense aortic aneurism was developed which carried him off in a few months.

The *symptoms* of aneurism of the aorta are threefold, owing to the effect on the circulation, the pressure exercised on the adjoining parts, and the presence of the sac itself. I have dealt at length with the condition of the pulse. Where both pulses are apparently alike, a sphygmographic tracing will frequently reveal a difference. If you have no such appliance at hand, you may tell the patient to raise both his arms above his head. In this position I have several times been able to make out by the touch a difference of which I had before none but sphygmographic evidence. Equally important in such cases is the observation of the so-called recurrent or retrograde pulse. If you compress the radial artery above the wrist with sufficient force to

FIG. 4.

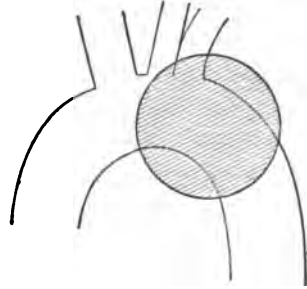


Diagram showing the portion of the aortic arch involved in the second case of aortic aneurism.

make the pulse disappear, you will find that it reappears almost instantly with unabated force, owing to the establishment of the collateral circulation by means of the ulnar and palmar arteries. The experiment will succeed in any person with a healthy, strong heart. Where there is interference, however, with the circulation in the sub-clavian, there the recurrent pulse is either belated or feeble, or altogether wanting. I have often turned this symptom to account.

Pressure symptoms on the part of the lungs are developed when the aneurism has grown so large as to seriously encroach on the space within the chest, or they are the result of compression of a large bronchus, as a rule, on the left side. The respiratory motions are diminished on that side; percussion reveals either a very full tympanitic sound or dulness, according to whether the lobe involved still contains air or not. Vocal fremitus is diminished or absent. On auscultation you find diminished vesicular murmur, or an absence of this symptom, and catarrhal *râles*.

Pressure symptoms on the part of the first air-passages are most often met with in the larynx, due to injury of the recurrent nerve, commonly on the left side, where it passes around the arch of the aorta. This leads to paresis of the vocal cord on that side. It occurs more rarely that the gullet itself is compressed by the aneurism. Even where this is the case, acute distress is generally not permanent, but comes on spasmodically whenever a strain is put on the impaired circulation of the parts. There is a symptom to which English authors are inclined to attach much importance,—namely, tracheal pulsation, which can be felt deep down behind the sternum when the patient's head is thrown back and the larynx pushed upward. I have found it to be of little value for the diagnosis of aneurism, as it is frequently met with in simple aortic regurgitation. I must admit, though, that *all* symptoms may be at fault when this differential diagnosis has to be decided. I myself have had a case which left no doubt in my mind as to its aneurismal nature, and yet the post-mortem examination revealed plain aortic regurgitation, with no sign of disease in the aorta proper.

Where sympathetic fibres are involved, the pupils are apt to be of different sizes. In our case we found the pupil of the affected side, the left one, dilated; it is just as often, however, contracted. In the former case the nerves have been irritated, in the latter they are paralyzed.

I need hardly revert to the possibility of the œsophagus being compressed by the sac, which in the case of aged people may lead to

an erroneous opinion that carcinoma is present. You are aware of the old golden rule never to pass a sound through the œsophagus until you have ascertained the absence of aneurism. Failing in this precaution, you may possibly rupture the sac, thereby occasioning fatal hemorrhage. It has been claimed that you can make out whether a stenosis of the œsophagus is due to aneurism by passing down a rubber tube filled with water, the fluid in that case rising and falling simultaneously with the pulse. I warn you not to put faith in this symptom, as I have frequently observed it in patients not suffering from aneurism.

In the way of nervous symptoms we commonly observe pain in the chest, irradiating towards the left shoulder, brachial neuralgia, formications, and even paresis. Manifold other nervous troubles may occur, varying in each individual case; thus our patient, you will remember, suffered from pain during mastication. Fits of angina pectoris, asthmatic attacks, and paroxysmal tachycardia are by no means rare. The patients are often troubled with persistent insomnia. The pain is generally less when they lie on the right side.

The symptoms which are the direct outcome of the aneurism itself have been sufficiently set forth while we examined our patient. As the sac increases in size expansile pulsation and later on a protruding tumor becomes evident. There is no tissue that can resist the steady advance of an aneurism. The breast-bone, the ribs, or the spinal column are gradually worn through by a process of chronic inflammation whereby the lime salts of the bone are absorbed. When the cord is attacked we observe the usual signs of compression, of myelitis, or of spinal meningitis. At any time the bursting of the sac may put an end to the patient's suffering. Or he succumbs to general marasmus, inanition, suffocation in consequence of compression of the trachea or of a bronchus, or to some intercurrent disease.

TREATMENT.—As the danger in aneurism consists in its tendency to unlimited growth, it must be our main endeavor to check this. From an etiological point of view such remedies deserve preference as are most calculated to interfere with the progress of disease in the walls of the artery. In this respect iodide of potassium is more to be relied upon than any other drug, not only where there is a history of syphilis, but in every case. Many authors state that aneurisms have been made to shrink, and have even been cured, by long-continued large doses of the iodide,—beginning with two grammes (= one-half drachm), and steadily increased,—prolonged sojourn in bed, and proper nourishment. Little or no good may be expected to accrue

from the internal administration of ergot and its preparations, and of acetate of lead.

Chemical substances (perchloride of iron) have been injected into the sac, with a view of obtaining coagulation of the blood, but this is a practice far too dangerous to be encouraged, since particles of clotted blood are apt to be carried away by the circulation, and deposited elsewhere as emboli. More rational, though hardly more efficacious, is the injection of ergot alongside of the sac, in order to induce contraction in the non-striated muscular fibres of the wall. The dose is one-tenth to one-third gramme ($1\frac{1}{2}$ to 5 grains) of the aqueous extract dissolved in water or in glycerin. In a considerable number of cases recourse was had to electricity for the purpose of coagulating the blood within the aneurism. Either both poles were introduced into the sac by means of needles—*electropuncture*—or only one, the other being applied to the patient's back, and the galvanic current was allowed to pass through. The same objections apply to this method as to the introduction of chemical agents. Not a single case appears to have been cured, or even benefited for any length of time, whereas death resulted in a number of instances.

The introduction of solid foreign bodies into the sac to serve as a nucleus for coagulation is another method which is frequently employed. Wire is generally taken, but any other thin aseptic material does as well, such as horse-hair or *fil de Florence*. Many of these cases died within a short time after the operation, and in a number of them the material introduced was found embedded in recent clot, which could be readily distinguished from the older laminated, decolorized fibrin by its soft consistency and dark-red color. I myself have operated on a case of aneurism of the descending aorta in conjunction with Professor Sonnenburg. A prominent pulsating tumor of the size of an apple had developed between the spine and the left scapula. We performed the operation in two instalments, first making several incisions down on the tumor, so that the superjacent skin came to be closely adherent to the sac; then, a few days later, puncturing the sac by means of a curved trocar. No blood issued upon extracting the needle. Thereupon we introduced thirty feet of thin platinum wire, which snapped and had to be reintroduced several times. The patient felt none the worse for having been operated on. The next day, raising himself incautiously, he fell back in his bed, and was dead. The autopsy revealed a perforation of the anterior wall of the sac, which could not have been occasioned by the wire. Most of the platinum was found buried in laminated fibrin of long standing; this explained why it had

repeatedly broken off. Some of it protruded, and was covered with recent clot. This case shows how the wire is apt to be caught in the hard mass of old clot. It also shows that coagulation is really produced by this means. Whether this is of any practical value is another question. Even supposing the clot not to remain soft or *passive*, as we have good reason to believe it does, but to become hard and laminated, like that which already lines the walls, will it, any more than this other, be able to arrest the course of the aneurism and keep it from enlarging? In all probability it will not, for this fibrin is never organized and converted into real live tissue; it always remains a mere passive bulwark, which perhaps obliges the aneurism to grow more slowly, but does not act as a serious hinderance.

This being the case, our therapeutic efforts are confined, in the main, to affording symptomatic relief. For neuralgic pain salicylate of sodium and antipyrin may be given to advantage. Iodine, in the shape of the iodides of sodium and of potassium, is often found to be of much use in stenocardic and asthmatic attacks, and in pain owing to this cause. Where these fail to act, and for persistent insomnia, the cautious exhibition of narcotics is indicated,—bromide of potassium, sulphonal, somnal, and, if necessary, chloral hydrate. The surest effect is obtained by subcutaneous injection of morphine. Where palpitations are prominent, and the arteries pulsate very strongly, an ice-bag should be applied to the region of the heart (not directly, but with an intervening layer of linen), and digitalis administered, either alone or together with strophanthus or valerian. In general, a *rational hygienic and dietetic régime* should be prescribed, forbidding violent exercise of any kind and mental fatigue. The food should be very digestible and nutritious, the bill of fare to include many green vegetables (spinach, asparagus, lettuce) and fresh fruit. The action of the bowels should be attended to. Any violent motion or effort, especially pressing when at stool, may burst the aneurism. When the aneurism protrudes as a visible, prominent tumor, it should be protected from pressure and injury by a well-fitting, hollow, padded, metal cap.

A CASE OF PULMONARY MURMUR.

CLINICAL LECTURE DELIVERED AT GUY'S HOSPITAL, LONDON.

BY W. HALE WHITE, M.D.,

Physician to Guy's Hospital.

GENTLEMEN,—The patient I am showing you to-day is of exceptional interest because she has a most unusual murmur, and although in many ways the case is so uncommon that you may never see another like it, and, also, I am by no means sure of the cause of the murmur, yet I do not think we could have a better subject for a clinical lecture, because the patient makes us consider the whole question of pulmonary murmurs.

Annie C., aged twenty-four, was admitted on August 23, 1895, into Mary Ward. She came complaining of swelling of the legs and abdomen. The family history is good, and in no way bears on the case. The patient is a temperate woman, who has never had syphilis or rheumatism. She is engaged in ordinary household work, which is not particularly arduous. She has had three children, the last born early in July. Her labors have always been easy and straightforward.

Last January she noticed that her ankles swelled after much standing, and some time before that she felt some palpitation and shortness of breath, and had an occasional cough. The œdema of the feet became worse, and as these symptoms did not subside after her confinement, she came into the hospital. Three days before admission she had some hæmoptysis.

On Admission.—She is pale; there is no lividity and no capillary pulsation can be obtained.

Circulatory System.—The pulse is 90 and does not feel abnormal. The cardiac impulse cannot be seen, owing to the large development of the breasts. Pulsation is visible to the left of the sternum about the second and third ribs. The impulse which is heaving in character can be felt in the sixth interspace a quarter of an inch external to the nipple line. A systolic thrill can be felt in the pulmonary area, and pulsation can be felt through the diaphragm at the ensiform

cartilage. The cardiac dulness extends outward as far as the left nipple and slightly to the right of the sternum, but otherwise it is normal. Over the pulmonary area there is a loud rasping to-and-fro murmur, the systolic part of which is more rasping and louder than the diastolic. It is conducted upward and to the left. The diastolic murmur can be heard a little way down the sternum; both murmurs are very much less loud on the right of the sternum than on the left. At the apex there is a systolic murmur which from its character is perhaps the same as that heard at the base. It is not conducted into the axilla. There is a systolic murmur nearer the ensiform cartilage, which is probably produced at the tricuspid orifice.

Respiratory System.—The only thing abnormal is that the resonance is distinctly impaired on the left side in front, between the clavicle and the third rib. This is not so marked near the sternum, but it extends out to the shoulder. Bronchophony is slightly diminished over this area, and perhaps the air does not enter here so well as at the right apex. The abdomen contains fluid and there is much cedema of the legs.

The liver cannot be felt. There is no albumen. She was ordered tincture of digitalis, ℞ x; tincture nucis vomicæ, ℞ x; caffeine, gr. x; sodii salicylas, gr. v; aquæ chloroformi, ℥i, thrice a day, and thirty grains each of sulphate of sodium and sulphate of magnesium every morning.

Under this treatment she improved considerably in every respect, and, as you see now, she is fairly well when she does not exert herself much. She was kept in bed for about a fortnight. The cedema of the feet and the ascites have disappeared. The physical signs have slowly changed. The diastolic murmur has become less marked and is now very short and faint. The systolic murmur remains the same except that perhaps it is not quite so harsh, slowly there has, however, developed a long, loud, harsh, blowing sound occupying the whole of the systole and the greater part of the diastole. This is best heard over the second left costal cartilage, and from there its intensity is rapidly lost downward and to the right, but it can be heard some distance up to the left, and also it and the systolic murmur can be heard between the left scapula and spine at the back. The systolic and diastolic murmurs are heard through it, so to speak. The thrill is still well marked, but it is now prolonged a little into the diastole. The apex gradually shifted inward and now it is in the nipple line. The systolic murmur is still audible there and for a little way into the axilla, and it is still quite possible that a tricuspid murmur is present.

The murmurs over the pulmonary area are more marked in inspiration than in expiration, and their intensity is diminished by firm pressure with the stethoscope. A sphygmographic tracing shows nothing abnormal. The dulness at the left apex of the lung is now very evident and is rather more extensive than on admission. The temperature has always remained normal. Now, gentlemen, clearly the first thing to be determined is whether the murmurs heard over the pulmonary artery are produced in it. Two suggestions were made when the patient first came in. One was that possibly she had pericarditis and that the to-and-fro sound was a pericardial rub. You must always be on the look-out for a pericardial rub when you hear a to-and-fro sound over the heart, especially when, as in this case, the sounds are rough and rasping. The last case that I had under my care, in which there was a congenital malformation of the heart, had a loud rasping to-and-fro sound over the base of the heart; nearly every one who examined the boy thought he had pericarditis, a supposition which turned out to be quite incorrect. However, we decided that the patient before you had not got pericarditis, for the systolic sound was conducted far up to the left, the diastolic was conducted down the sternum, the pericardial dulness was not increased, she had no pain nor tenderness, and there has been no elevation of temperature. The course of the case has shown that we were correct in excluding pericarditis, for the murmurs are not now such as could be produced by the pericardium, and, indeed, in no way has the case shown any resemblance to pericarditis.

The next suggestion was that the patient had disease of the aortic valves, and that is most important. You know, of course, that an aortic to-and-fro murmur is usually best heard to the right of the sternum, but you must never forget that for some unexplained reason an aortic to-and-fro murmur is often heard better to the left of the sternum than to the right. Unless you bear this in mind you will constantly make mistakes. However, in our patient we decided that the murmurs were not aortic. In the first place the systolic murmur went much too far up to the left, and the diastolic was very feebly conducted down the sternum. The pulse was not suggestive of aortic disease, which is very rare in young women apart from rheumatic endocarditis, and our patient gave no rheumatic history. The other causes for aortic disease are syphilis and strain, both of which lead to atheroma, but neither of them had existed in this patient, so we decided to exclude aortic disease, and the alteration of the murmur and the subsequent progress of the case have amply justified us.

We therefore came to the conclusion that the murmurs were produced in the pulmonary artery, and consequently we had to decide whether they were (1) hæmic; (2) due to the remains of intra-uterine endocarditis of the pulmonary valves; (3) due to malignant endocarditis of them; (4) caused by a patent ductus arteriosus; (5) due to an aneurism of the aorta opening into the pulmonary artery; (6) caused by an aneurism of the pulmonary artery; (7) caused by a dilated pulmonary artery; (8) caused by pressure on the pulmonary artery from without; (9) a result of congenital malformation of the heart.

1. *Hæmic Murmur*.—I only mention this because it is the commonest murmur produced in the pulmonary artery; but remember that a hæmic murmur is always systolic, and as there was a diastolic murmur present in this case we never seriously considered the possibility of the murmurs being hæmic, and the presence of backward signs also showed that the murmurs were organic. Then you will notice that the lungs have escaped from the backward signs, the cardiac dulness extends to the right of the sternum, and the right ventricle can be felt beating through the diaphragm, all these facts confirming the views that the trouble is organic and is in the pulmonary artery or in the right side of the heart.

2. *Intra-Uterine Pulmonary Endocarditis*.—Endocarditis on the left side of the heart in intra-uterine life is excessively rare, while endocarditis on the right side—apart from malignant endocarditis—hardly ever takes place after birth, but intra-uterine right-sided endocarditis is by no means rare. It affects the pulmonary valves with much greater frequency than the tricuspid, as a result there is obstruction to the propulsion of blood through the orifice of the pulmonary artery, and because the blood in the right ventricle must find an exit somewhere, it does so through the as yet unclosed septum ventriculorum, and consequently the complete closure of this is prevented, and the child is born with a narrowed pulmonary orifice and a septum ventriculorum which is patent at its upper part. The majority of such children are, when born, uniformly livid; they are cold; their fingers are clubbed, and a loud systolic murmur can be heard over the pulmonary orifice. Usually they die in early childhood, but if pulmonary obstruction is not great they are not livid, and frequently survive some years; in such cases a systolic murmur, loudest over the pulmonary orifice and conducted upward and to the left, can be heard, and the patient is always more or less short of breath. Probably in these cases the pulmonary obstruction has not been sufficient to prevent the closure of the septum ventriculorum, and the hypertrophy of

the right' ventricle has been well maintained. The suggestion was quite rightly made that this was what was the matter with this patient, but I think the following objections will dispose of this view. Two great dangers threaten to these patients, one is that they will die in childhood or young adult life from phthisis. You will remember that phthisis is not commonly associated with left-sided heart-disease, it is said, because the lungs are constantly congested, owing to the difficulty the blood has in passing through the diseased left side, and therefore it is easy for you to remember that pulmonary tuberculosis is a common danger when, owing to obstruction at the pulmonary valves, the lungs contain less blood than they should. The other danger is that the heart in these cases breaks down at puberty, backward signs quickly develop, and the patient dies. This is not surprising when you remember that the rapid growth of all the organs in any way associated with the sexual function and the addition of a new function must increase the demand made upon the circulatory power of the heart. But even supposing that puberty be survived, there are other dangers ahead, for it is a well-known fact that extra demands are made upon the cardiac energy during pregnancy, and that therefore a diseased heart is very liable to give way then. You will, I dare say, in the course of your practice be consulted by a mother as to the best way to bring up a child with pulmonary stenosis who has survived early childhood. You should direct that he should lead a quiet life in the country, with plenty of fresh air, so as far as possible to avoid tuberculosis, and, while he should not be coddled more than necessary, he should indulge in no exercise which would throw any strain upon the heart. I have recently seen such a condition of affairs in a little boy, aged twelve, who gets on very well and is very happy and amuses himself chiefly with driving, fishing, and croquet. Then you must warn the mother to take especial care during puberty, and even if it be survived neither sex should marry. It is true that about three months ago there was in Stephen Ward a man with congenital pulmonary stenosis who was over thirty and seemed very little the worse for it, but please remember that such cases are in the highest degree exceptional.

To return to the woman you see before you. I think it is extremely unlikely that a woman of the working classes could have pulmonary stenosis and could by the age of twenty-four have borne three children and yet be as well as she is. But the sounds alone are enough to make us very suspicious of such an explanation, for, whilst when the aortic valves are diseased a to-and-fro murmur is common

for some unexplained reason, a diastolic murmur due to congenital disease of the pulmonary valves is one of the rarest murmurs we hear. Further disease of the pulmonary valves would quite fail to explain the loud rumbling sound running through systole and diastole which this patient has developed. So for all these reasons we have decided that she is not the subject of endocarditis of the pulmonary valves, and I may add that such a view would fail to explain the dullness at the right apex, for there is no evidence of active phthisis there, and phthisis once developed in patients suffering from disease of the pulmonary valves rarely becomes quiescent.

3. *Malignant Endocarditis*.—This is the only form of right-sided endocarditis which develops after birth and affects the pulmonary valves. It is not excessively rare. I find that we have on the average one case a year at Guy's of right-sided malignant endocarditis, and that the tricuspid valve is affected four times for every time that the pulmonary is implicated. Some years ago a man was under my care in whom the diagnosis was easy, for he had rigors, pyrexia, and a loud rasping systolic murmur over the pulmonary valves conducted upward and to the left. At the post-mortem examination enormous fungating masses were found on the pulmonary valves. There is at present in No. 33 bed, Stephen Ward, a man in whom perhaps the same condition is present.

When this woman first came in we thought that possibly she too might be suffering from the same disease, for although in congenital pulmonary disease a diastolic murmur is so excessively rare it has often been heard when malignant endocarditis has affected the valve. Then too, although the history did not very well accord with such a view, it was possible that her malignant endocarditis was due to infection after delivery.

We have had one or two instances of this in the hospital lately. Her anæmia was also in favor of malignant endocarditis. But as her temperature has never been above normal and she has improved so considerably, and has developed a long sound running through systole and diastole, this view is very unlikely, and now I do not think she is suffering from malignant endocarditis. Still, it is well to remember that this disease may be very chronic. I have known it to linger on for months, and sometimes the patient gets well enough to go out, and then returns to the hospital later and dies, it may be six months after the first onset of symptoms. Then, too, I have seen a patient with every symptom of the disease get quite well.

4. *Patent Ductus Arteriosus*.—This may be associated with congeni-

tal disease of the pulmonary valves, but we have seen reason to suppose that this does not exist. Patent ductus arteriosus apart from other cardiac deformity is so very rare that one hesitates about the diagnosis. Dr. Fagge¹ says, "very few cases are on record in which a persistent ductus arteriosus has given rise to a murmur." In his own case there was a systolic murmur loudest at the fourth and fifth left costal cartilages and diminishing in intensity downward and towards the axilla, and a wavy, partly musical murmur, heard best at the second left costal cartilage, directly following the second sound and occupying the first four-fifths of the diastole. He quotes a case from Kaulich, in which there was a prolonged diastolic rasping murmur most intense over the third rib, and a systolic murmur at the same spot. Dr. Taylor, writing in the Guy's Hospital Reports, quotes a few cases; in one there was a systolic murmur and in the others either no murmur could be heard or other lesions were present. My only experience of a patent ductus arteriosus is that when I was demonstrator of anatomy I examined a subject in the dissecting-room in which a patent ductus arteriosus was about the calibre of an anterior tibial artery. The injecting fluid had passed from the aorta through the patent ductus into the pulmonary artery, which was consequently fully injected. The subject was a man aged fifty-three, who died in the City of London Infirmary, and Dr. C. H. Buncombe told me that when there he had a loud systolic murmur limited to an area of two and a half or three inches, and heard best over the second left intercostal space close to the sternum. I think you will agree with me that, judging by the murmurs only, it is possible for the woman before you to have a patent ductus arteriosus, and further, as in Dr. Fagge's case, the extra quantity of blood in the pulmonary artery may cause the backward signs from which she suffers, and there will be no evidence of any backward signs in the lungs. But this diagnosis quite fails to explain the dulness at the left apex.

5. *An Aneurism of the Aorta opening into the Pulmonary Artery.*—There are several cases of this on record and Dr. Taylor has collected them. Among twenty-six cases seven died suddenly. Among the remaining nineteen, in seven a systolic murmur was present; in six there was a continuous murmur occupying systole and diastole, and in six there was a to-and-fro murmur. In several a thrill was present. Many of these nineteen died soon after the rupture, but of the cases in which, from the appearance of things at the post mortem, it appeared that the communication had existed some time, in all but one there was

¹ Guy's Hospital Reports, 1872-73.

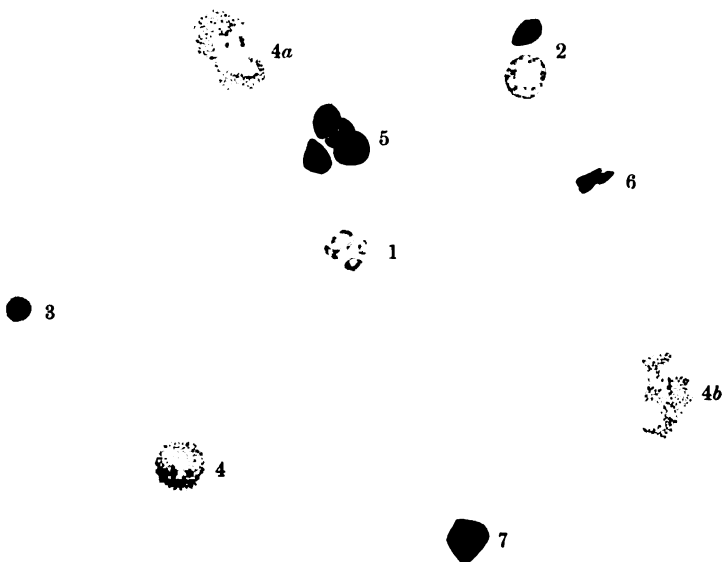


FIG. 3.—1-4, *white blood-corpuscles*. 1, polynuclear leucocyte; 2, large mononuclear leucocyte (liencyte); 3, small mononuclear leucocyte (lymphocyte); 4, eosinophil cell; 4a, 4b, two stages of disruption of No. 4. 5-7, *red blood-corpuscles*. 5, of normal shape, one slightly deformed; 6, much deformed; 7, with nucleus.

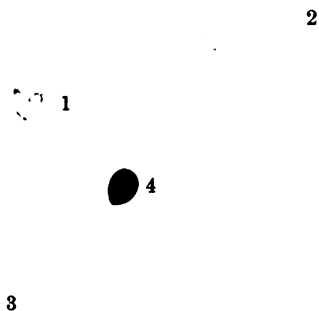


FIG. 4.—1, polynuclear white corpuscle with neutrophil granules; 2, the same disrupted, with nucleus; 3, disrupted without nucleus; 4, red corpuscle. Fig. 1 is stained with eosine and logwood; Fig. 2 with Ehrlich's "triacid" stain.

a continuous murmur occupying the systole and diastole, heard best over the base of the heart, and often best over the pulmonary artery. Thus you see that, judging by the murmurs only, it is very probable that this woman has an aneurism of her aorta opening into the pulmonary artery. But an aneurism in so young a woman is very rare, and, again, aneurism in women is almost always due to syphilis, from which this woman is free; but still you must remember that two years ago there were in our Clinical Ward two young adults, one a woman and the other a man, both of whom died from intracranial aneurism, although neither had had syphilis or malignant endocarditis. It is not easy, however, on this supposition to explain the dulness at the left apex, for an aortic aneurism could hardly reach up to the left shoulder without giving pain and pressure symptoms.

6. *An Aneurism of the Pulmonary Artery.*—Aneurisms of the branches of the pulmonary artery are by no means uncommon in phthisis, but an aneurism of the main trunk is so rare that we know little of its physical signs. Judging by our knowledge of aneurisms of the aorta we should hardly expect the murmurs we hear here, and then again we have just seen that it is extremely unlikely that this woman has an aneurism.

7. *Dilated Pulmonary Artery.*—This is by no means uncommon, and is nearly always due to an increased pressure in the artery as a result of disease of the lungs or of the left side of the heart; the artery becomes thickened, dilated, and may be atheromatous. The signs produced are very variable. Sometimes the condition is found in the post-mortem room when it was never suspected during life; on the other hand, it may be diagnosed from the presence of a murmur heard about the second and third left intercostal spaces. Very few authors have discussed the diagnosis of dilatation of the pulmonary artery, but Dr. Goodhart has particularly called attention to these cases. Now we can understand that the passage of the blood from the right ventricle through the pulmonary orifice into the dilated artery would give rise to a systolic murmur. This is common enough on the left side of the heart when the aorta is dilated. Also, if the increased pressure in the pulmonary artery were very great, the pulmonary orifice might stretch, and regurgitation with a diastolic bruit would result, and you will find instances of both these results in Dr. Goodhart's paper in the Guy's Hospital Reports; but I must confess that I do not understand how a dilated pulmonary artery will produce the long sound we hear in this patient, occupying both systole and diastole. Then we must remember that, in this case, we have very little cause for a dilated

pulmonary artery. I do not think that the dulness at the left apex indicates sufficient pulmonary obstruction to cause it, and although it may be that the apical murmur is caused by some mitral regurgitation, still the condition of the lungs and the general state of the patient do not point to that being severe enough to cause a very much dilated pulmonary artery. Before leaving this subject I ought to remind you that not long ago Dr. Bryant made a post-mortem examination on a young woman in whom the pulmonary artery was dilated and atheromatous without any obvious cause. Such a condition must be excessively rare, and I do not know of its having been diagnosed during life.

8. *Pressure on the Pulmonary Artery from Without.*—The dulness at the left apex, together with the diminished bronchophony, is very suggestive of thickened pleura, and so it has been pointed out that, possibly, this may in some way be constricting the pulmonary artery and causing the murmurs, and it is, perhaps, in favor of this view that they are of different intensity in expiration and inspiration and on deep and light pressure, although the importance of this is less than it would be in other parts owing to the superficial position of the pulmonary artery. But if this were so the compression by the pleura ought to cause a systolic murmur as the blood passed through the constriction, and, possibly, a diastolic murmur when the blood fell back a little onto the closed pulmonary valves in diastole. But not only is such a condition excessively rare, but also, as the pericardium is continued onto the pulmonary artery, it is very doubtful whether the thickened pleura could do more than implicate the left branch, and I do not see how even then we could explain the long sound we have here. Although, therefore, this explanation is, at first sight, very tempting, there are very serious objections to it.

9. *Congenital Malformation of the Heart.*—A great many malformations of the heart have been described, and it is too wide a subject to discuss now. Nor is it necessary, for, in the first place, you must remember that it is excessively rare for the sufferer from cardiac malformation to attain the age of this patient,—most of these cases die in early childhood or at puberty; and, secondly, these malformations are so rare in those who long survive their birth that no one can have an extensive clinical experience of them, and consequently the differential diagnosis between them is almost impossible. The only one that is worth discussing separately from a clinical point of view is a patent ductus arteriosus, and that we have already mentioned. You will understand how difficult the diagnosis of congenital malformation is when

I tell you I have never seen or made a post-mortem examination on a case in which the malformation that was supposed to exist during life has been found after death. I think you ought to rest content if you can make out whether your patient is suffering from congenital pulmonary endocarditis with a patent septum ventriculorum or from *some* congenital malformation. The murmurs heard in the present case are very like those of the last case of congenital malformation under my care, in which there was a patent septum ventriculorum and a communication between the right ventricle and aorta. You will notice that this is much the same thing as a communication either by a patent ductus arteriosus or aneurism between the pulmonary artery and the aorta, and thus this case lends some support to the view already expressed that it is, on the whole, likely that some communication between these vessels exists in the patient before you. I am afraid that time forbids our discussing to-day more than the diagnosis of the case.

A CASE OF SPLENIC LEUKÆMIA WITH FEVER, WITH REMARKS ON THE NATURE OF LEU- KÆMIA IN GENERAL.¹

CLINICAL LECTURE DELIVERED AT THE CHARITÉ HOSPITAL.

BY O. HEUBNER, M.D.,

Professor p. o. in the University of Berlin and Director of the Pædiatric Clinic, etc.

LECTURE II.

GENTLEMEN,—The case I am about to show you is one of leukæmia, a disease that is met with in children rather more rarely than in adults.

The patient is a boy nine and a half years of age, coming of a healthy family. He is the second child; his two brothers are healthy. The mother has had two miscarriages; cause unknown; there are no reasons for assuming syphilis. He was reared on mother's milk, and was able to walk when ten months old; he has had measles and scarlatina, etc. I need not enumerate in detail all that has been gathered; I will merely say that he was in all respects a sound and normal child,—healthy, well-nourished, and of good color. He continued thus until a year and a half ago. Then, in spite of plenty of good, wholesome food and a good appetite, he began to grow lean. This is an unusual way for the disease to begin; as a rule, it is the appetite that fails first. His mother noticed further that he perspired profusely during the night and had occasional attacks of fever. On one occasion this lasted for a week, and he was delirious. We were inclined, in the beginning, to doubt the correctness of her observation, but the temperature-chart soon verified her statement. This state of things had been going on for a year when the left side of the boy's abdomen was observed to increase steadily in size, without causing any pain or inconvenience. Thereupon the parents brought him to the hospital.

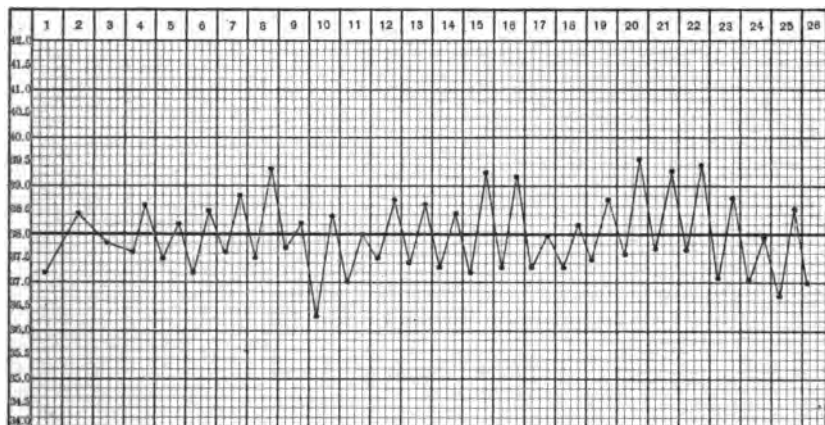
Looking at his face, you will notice that it does not by any means exhibit the grayish pallor characteristic of leukæmia. His cheeks are

¹ Reported by H. Cleves-Symmes, M.D.

still rosy, his ears red,—everywhere the bright color of the blood shows through the skin. His appearance would not lead anybody to suppose that serious changes had been going on in his blood for a long time. Schultze, in Bonn, in a recently-published important article on the subject, has pointed out that it happens more frequently than was supposed to be the case, that the visible alteration in the color of the skin sets in only at a later stage of the disease.

The temperature-chart, as I remarked before, agrees with the mother's statement; it goes even further, presenting a condition of continual fever. The evening elevation is hardly ever below 38° Celsius (= 100½° F.), and often above 39° C. (= 102½° F.). You will

FIG. 1.



Temperature record of a case of splenic leukæmia in a boy of nine and a half years.

notice at the same time how far the morning and evening temperatures lie apart; not once or twice, but continually. This points to a peculiarly unstable condition in the regulation of the body temperature. It is sometimes found in cases with no well-pronounced fever, and should make us suspect the presence of some latent general trouble of the system. It is not the rule that fever accompanies leukæmia; generally the temperature remains normal throughout the course of the disease, unless some local reason can be assigned for its rise,—such as pleurisy, for instance, or some other inflammation. We should bear this fact in mind in examining the various organs, for it is only by excluding every other cause that we are enabled to make a diagnosis of pure leukæmic fever.

The pulse runs usually over one hundred; at present it is one hundred and twenty; this acceleration, beyond the rate usual for his

age, is due to the fever. He has eighteen respirations a minute; no dyspnœa. The tongue is slightly furred; appetite good. The back of the mouth must also be examined, for sometimes leukæmic infiltrations—that is to say, accumulations of leucocytes within the tissue—are found here, at first glance resembling diphtheritic deposits. While this is being done, I may tell you what has been the result of our examination of the fundus of the eye. Although the disk was not sharply defined, its margin could be readily made out. No leukæmic infiltrations were seen in the retina; these would have presented themselves in the shape of shiny white spots, with hemorrhages in the neighborhood. In the mean while the throat has been examined; nothing abnormal has been found.

The organs calling for particular attention in leukæmia are the *spleen*, the *lymphatic glands*, and the *bones*. This being the case, we shall for once depart from the usual plan of carrying on our examination topographically from one region to the next. We shall, instead, follow a physiological sequence.

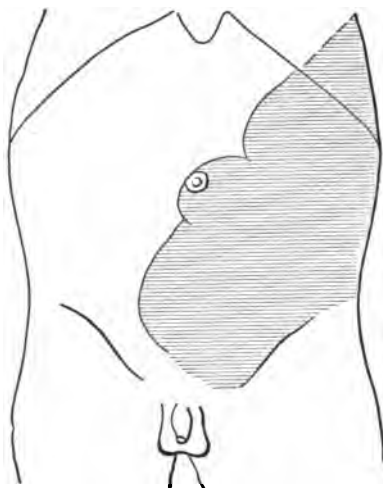
Taking first the lymphatic glands, we find several of the size of a bean at the back of the neck and in both axillæ. There is nothing unusual in that, and it cannot be taken as evidence of leukæmic tumefaction. Some authors, particularly those in France, have pronounced the opinion that gland tumors occurring simultaneously in different regions point to tuberculosis. To me this statement appears highly doubtful. You may remember the little girl with rachitis whom I presented for your examination some time ago; she had numerous enlarged glands, yet *post-mortem* examination showed no signs of tuberculosis. This is one of many instances that have led me to the conclusion that mere hypertrophy of the lymphatic glands may be due to various causes.

As to the marrow of the bones, the orthodox method of determining whether it is affected is to test the sensitiveness of the bones to touch, preferably that of the sternum. They undoubtedly are rather sensitive in some cases, whereas in others they behave quite normally; and, indeed, I fail to see why the bones should be painful. The presence of this symptom thus proves little, its absence nothing; least of all does the absence of pain in the bone justify a conclusion that no disease of the marrow is present. (Fig. 2.)

The swelling of the boy's abdomen must have caught your eye from the very beginning. On the left side you feel a huge, hard tumor, with a sharp border passing downward across the abdomen obliquely from left to right. Two indentations can be distinctly felt

in this margin, leaving no doubt as to the tumor being the spleen. It extends to the right beyond the median line, almost reaching the crest of the ilium. By percussing we can follow it up under the margin of the ribs to within an inch and a half of the vertebral column. The spleen itself goes farther back, but the lower border of the lung overlapping its upper end, where it is in apposition with the diaphragm, renders this part inaccessible to us. Its upper limit is found to cor-

FIG. 2.



Area of splenic dulness.

respond not, as ordinarily, to the ninth, but to the eighth rib. Its total length, estimating the upper concealed portion as four centimetres, amounts to thirty-six centimetres and a half, whereas the normal measurement at his age would be eight or nine centimetres; it is thus four times as long as usual. Its breadth is twelve and a half to thirteen, instead of between three and four, centimetres. These numbers afford you an idea of the excessive hypertrophy of the spleen, producing an increase in its size to at least twenty times the normal volume. Malaria is out of the question in this case, the boy never having been in any part of the country where this disease has existed.

The liver can be felt below the costal margin. Put your hand on the abdomen with the fingers pointing upward. The patient opens his mouth and breathes slowly and regularly. Now firmly and yet with great gentleness you embed your fingers—not the tips only—during each expiration, gradually getting deeper, until you feel the edge of the organ. Considering that, owing to increased intra-abdominal press-

ure, the liver has been pushed up into the thoracic cavity, the fact of its standing out beyond the ribs is a sure sign of its being enlarged. Pleurisy being frequently responsible for the fever in leukæmia, we must guard against the mistake of confounding the dulness due to effusion within the pleural cavity with enlargement of the liver. The two conditions are easily distinguished by steadily percussing the area of dulness during one or several entire phases of respiration. The liver, being situated *beneath* the diaphragm, is pressed downward during inspiration, making way for the lungs, whereby the sound is rendered more clear; during expiration it grows dull again. Where there is pleuritic effusion, on the other hand, the lungs cannot move downward into the complementary space, and respiratory changes in the nature of the sound do not, of course, take place. Here the sound varies, proving the liver is enlarged. At the same time, owing to the encroachment of the liver upon the lungs, the latter are slightly relaxed in their inferior portions, in exactly the same way as though the pressure came from an effusion within the pleural sac. Therefore we notice here the same tympanitic sound just above the area of liver dulness that we would have found had this actually been a case of pleurisy. The liver reaches to the fourth (instead of the sixth) rib, and, in the other direction, six and a half centimetres below the costal margin in the parasternal line, giving a total height there of fifteen centimetres; in the median line its height is between thirteen and fourteen centimetres (instead of nine or ten). Both the liver and the spleen are thus seen to be greatly enlarged. The glands do not share in this enlargement.

The fever not being explained by pleurisy, we must make certain whether it is not due to morbid processes in the lungs. Percussion fails to show any difference between the right and the left apex. Nor does auscultation reveal an abnormal condition of the lungs or of the bronchial tubes.

The impulse of the heart is felt in the fourth intercostal space, the organ thus sharing in the general upheaval of the contents of the thorax. At the same time, by reason of the greater convexity of the diaphragm, it is in greater measure adjacent to the walls of the chest. As a consequence of this its area of dulness is enlarged. You know that it is, anyway, comparatively large in children. As long as it does not overstep the right edge of the breast-bone, it must be considered normal. The sounds of the heart are clear. There is no blowing or humming sound heard over the jugular vein.

The urine amounts to eleven hundred cubic centimetres (about two

pints) a day. It contains no albumen, but a great quantity of uric acid, nine-tenths of a gramme (= 15 grains) a day. This is a very important item, as you will find out later on in the course of this lecture.

I have reserved the most important point for the last,—namely, the examination of the blood. A number of microscopes have been set up for you near the window with fresh specimens and stained preparations of the blood. In the former you will notice an increased proportion of white blood-corpuscles. That alone is not sufficient to sustain a diagnosis of leukæmia, since a slight rise in the number of the white bodies is a physiological phenomenon, regularly recurring after each meal. It has been observed also in tuberculosis and in a number of other diseases as a mere concomitant symptom, vanishing as soon as the underlying affection is cured. Now we have counted the corpuscles in this case, and we have found the number of white ones to be 106,000, and of the red 3,300,000 per cubic millimetre of blood; that gives us a proportion between the two of from 1:30 to 1:32, the normal rate being 1:350 to 1:400. There is no doubt, therefore, as to this being genuine leukæmia; in leucocytosis the number of leucocytes in a cubic millimetre may go as high as fifty thousand at the utmost, whereas here we have more than double that amount. In severe cases this increase is even much greater. A slight diminution in the quantity of red corpuscles obtains here, as usual, leukæmia always being associated with more or less anæmia.

The diagnosis having been established by mere counting, we now turn to the stained specimens for its corroboration and amplification. We there find the red corpuscles of normal size, a number of them deformed and drawn out into various irregular shapes, mostly oblong. This, like the diminution in their number, is a sign of anæmia, and must not be confounded with the prickly-pear shape, round with serrated edge, due to shrinkage after the blood has left the vessels; this latter form is absent in our preparations. Some few of the red corpuscles contain nuclei.

Among the white corpuscles we note various shapes. There are the ordinary large polynuclear leucocytes slightly larger than the red corpuscles. Their nucleus is broken up into several, generally three, fragments, either connected with each other or quite separate. It is stained distinctly by the various dyes. The protoplasm of these cells is made up of numerous minute granules which readily take up neutral aniline stains. Further we find mononuclear leucocytes with one large round central nucleus occupying nearly the whole cell, and surrounded by a narrow protoplasmic margin. They are partly of the size of red

corpuscles, partly a little larger, in the latter case the nucleus is less deeply stained. Their protoplasm contains no granules. Besides these three there are a small number of cells of a fourth kind, with a divided nucleus and protoplasmic granules, stainable by means of *acid* aniline dyes. Of these latter so-called eosinophiles, as well as of the above-mentioned neutrophiles, many are found in various stages of destruction; in some the cell has merely lost its regular outline, the granules are beginning to scatter, a nucleus is there still; in others the nucleus has disappeared, and an irregular cloud of spots is all that is left. All the colorless corpuscular elements of the normal blood are thus seen to have taken part in the increase. It still remains to determine in what proportion this has taken place. Under normal circumstances there are about twenty-two to twenty-three per cent. of the mononuclear variety, and sixty to seventy per cent. of the polynuclear kind; the rest is made up of eosinophiles and of transitional forms between the mono- and the polynuclear types. In our present case we found, as the average of twenty-five fields of the microscope that were counted, thirty per cent. mononuclear and sixty per cent. polynuclear leucocytes, with ten per cent. eosinophiles.

The difference between this and the ordinary proportion is not very great, and, bearing in mind that there is a tenfold increase altogether, we may conclude that the different kinds have shared in it, the mononuclear in somewhat greater measure than the rest.

The reason why I go into detail regarding the results of microscopic research is because this is the only way in which our diagnosis can be carried any further. For the mere name leukæmia is as vague in its way as many other Greek terms, such as "*icterus*," "*status typhosus*," "*hydrops*," which all signify but a symptom. At first it was thought to imply a state of suppuration within the blood, until Virchow showed the impossibility of this, and that in reality it was a normal constituent of the blood that was augmented, sometimes as much as forty-fold. Virchow already had commenced distinguishing between different kinds of white corpuscles, but it is mainly to Ehrlich that we owe our present knowledge of this subject, for he it was that developed the methods of staining. Of the different kinds of leucocytes the mononuclear bodies are considered to be the youngest, next in order of time range the polynuclear shapes, and the oldest finally are the eosinophiles. Such at least is the view prevailing at present. From another point of view they have been divided according to their supposed origin. This distinction refers, of course, only to the mononuclear bodies, the others having secondarily developed out of them.

The smaller forms are believed to be the products of lymphatic glands; within the spleen is to be sought the origin of bodies larger than these, but inferior in size to those cells that come from the marrow of the bones. These latter are not present in our case. Independent of their being larger they are distinguished from the large lymphocytes of the normal blood by their protoplasm containing neutrophile granules. In the preparations before you the bodies with one nucleus are for the most part of greater size than red corpuscles, comparatively few among them are smaller. This agrees well with the absence of symptoms on the part of the bones and the glands, and with the enlargement of the spleen. There is no doubt, therefore, that this is a case of *splenic leukæmia*.

Arguing backward we might come to the conclusion, if we still adhere to Virchow's views in pathology, that organic disease of the spleen was at the bottom of the trouble. But I believe that I am not wrong in thinking that the majority of scientists nowadays lean to the opinion that this is a chronic infectious disease, whereof the main localization is in the spleen, to be sure.

It is a question of great interest how the increase of the white corpuscles in general and the preponderance in particular of the mononuclear variety are brought about. Is there so abundant an overproduction that a constant surplus is maintained owing to the newly-formed elements not disappearing with sufficient rapidity? Or is it that the white blood-cells, although produced at no more than the ordinary rate, yet by the longer life of each individual are allowed to accumulate enormously within the vessels? This would account for the diminution in the number of the red corpuscles, since so many of the white ones, by remaining what they were, failed to fulfil their destination of being converted into red ones. In support of this latter theory perhaps a case of Leube and Fleischer might be advanced, where none of the leucocyte-producing organs appeared to be affected, neither spleen, nor lymphatic glands, nor bones, and where consequently the blood itself was supposed to be the site of morbid alteration. This could consist in nothing other than retarded involution of the white corpuscles, if it was to explain their numeric increase. However, this observation so far stands alone. On the other hand, the theory of over-production, while perfectly agreeing with the local affections usually met with in one of the three systems mentioned above, is strongly supported by the conditions we notice in acute leukæmia. This variety, so called by Fraenkel in contradistinction to the ordinary or chronic form of the disease, is of very rapid onset, and exhibits almost

exclusively the mononuclear type of leucocyte. The inference from this is plain. I may as well at this point remark in passing that the presence of eosinophiles, either entire or disintegrated, bereft of their nucleus and consisting merely of a cloud of specks (Fig. 3 : 4, 4a, 4b), proves nothing, as these are also found in normal blood.

There is one other circumstance that argues powerfully against the theory of diminished involution. That is the secretion in greater amount of uric acid, corresponding to its presence in greater amount in the blood. The boy's food has been with great accuracy measured out to him for a couple of days at such a rate that he should under normal conditions have passed three-tenths of a gramme of uric acid a day ; instead of which he daily passed almost one whole gramme. These examinations have been made in our laboratory according to Professor Salkowski's method, and their correctness is not to be doubted. Measuring the uric acid alone, without having regard to the food consumed in the mean time, would naturally be of no value whatever, as one of the two numbers would be wanting that are required to make a proportion. It has been proved by the experiments of Kossel and his pupils that the secretion of uric acid is dependent mainly on the amount of nucleine destroyed by the body. Quite recently Weintraud was enabled to increase the output of uric acid by feeding his subjects on thymus gland, which contains a great amount of nucleine. Now, nucleine being, as the name implies, the main constituent of the cell-nuclei, the following appears to me to be a sound course of reasoning. Increased secretion, in other words, increased production, of uric acid means increased destruction of nucleine, and this implies increased dissolution of nuclei ; and this again, in all probability, denotes an increased destruction of leucocytes. This is well borne out by an observation of Fraenkel's that in acute leukæmia, where the mononuclear kind, the only ones present, had almost wholly disappeared, a sudden enormous increase took place in the amount of uric acid secreted. It seems pretty certain, therefore, all things considered, that both destruction and new formation of the white corpuscles are carried to an unusual length in leukæmia, but which of the two is the *primum movens*,—whether the new production merely serves to fill the gaps caused by undue activity of the destructive process, or whether it is itself the cause of this destruction,—that is more than we are able to tell at present.

The great interest of the matter has led me to enter on the theory of the disease at greater length than is my wont. We shall now have to turn our attention to the question of treatment.

The idea that this disease is of an infectious nature is supported in our case by the presence of fever for which we have not been able to assign any other reason. This is not the first time that this complication, if I may so call it, has been observed in leukæmia. Mosler has reported cases where the course was that of typhoid. The plight of our patient is not as bad as that, but still he may be said to have a chronic infective disease of a year's or half a year's standing. Agents of infection have been sought hitherto in vain. Had they been found, our treatment would be likely to be more successful. Mosler, to be sure, claims to have employed quinine with a curative effect in some cases. We have not so far seen any good to come from its use, but then we confined ourselves to doses of one-half a gramme (8 grains), whereas Mosler and Schultze drugged their patients till symptoms of intoxication, singing in the ears, and the like, obliged them to stop. We shall make a trial therefore of quinine in eight-grain doses. The result of our treatment hitherto has been a diminution in the number of the red instead of the white corpuscles,—in other words, we have been powerless to check the disease. You will have noticed some red corpuscles with a nucleus in the centre (Fig. 3 : 7), a sign that already raw recruits are being drafted to swell the thinning ranks of red soldiers.

Iron is a favorite remedy, but though we used one of the best new preparations from Ladewig's laboratory, carniferin, which contains a high percentage of the metal—forty per cent. I believe—yet we failed to effect any improvement. What is the good of piling on fuel where the machinery itself is broken?

Oxygen has been employed as a general roborant, but, strictly speaking, there is hardly any call for it. Pettenkofer and Voigt twenty-five years ago showed that the interchange between carbonic oxide gas and oxygen is not interfered with; so long as a patient lies quiet in bed and does not exert himself, his red corpuscles, though diminished in number and quality, are able to furnish him with sufficient oxygen.

Finally, there is still the very latest novelty in modern therapeutics, the treatment by organic fluids. We shall make a trial in this direction with spermine.

THE DIAGNOSIS OF TUBERCULAR PERITONITIS.

CLINICAL LECTURE DELIVERED AT THE PHILADELPHIA HOSPITAL.

BY FREDERICK P. HENRY, M.D.,

Professor of the Principles and Practice of Medicine in the Woman's Hospital
of Pennsylvania.

GENTLEMEN,—I think none of you has any difficulty in perceiving that the abdomen of the young man on the table is greatly distended. The swelling, you will observe, is perfectly symmetrical, although the superior surface of the abdomen is somewhat flattened. On percussion over this flattened area I obtain a well-marked tympanitic resonance, while on both sides and in the hypogastric region the percussion note is flat. On turning the man on his right side, the left side, previously dull, becomes tympanitic, and on reversing this manœuvre, the right side becomes tympanitic. On palpating the dull portions of the abdomen I obtain a distinct sense of fluctuation. These signs indicate unmistakably the presence of fluid in the abdominal cavity, and the case, therefore, is one of abdominal dropsy or ascites.

A century ago the diagnosis would have ended here, for dropsy was regarded as a disease. It is now known to be nothing more than a symptom common to a number of morbid conditions, and the problem before us is to determine which of these conditions has given rise to the dropsy in this case. Before attempting to do so I will mention and briefly discuss the chief causes of abdominal dropsy, for it is impossible to make a certain diagnosis in a case such as this without having them constantly in mind.

They may be divided into two classes: 1, Obstruction to the flow of blood through the portal system; 2, irritation and inflammation of the peritoneum.

Since nearly all the blood of the portal circulation passes through the liver, it follows that the greatest obstruction to this circulation is caused by disease in, or in the neighborhood of, that organ. Cirrhosis, syphilis, and carcinoma are the affections of the liver which most frequently give rise to ascites, and in the neighborhood of that organ any

CUTANEOUS MEDICINE.

A SYSTEMATIC TREATISE

ON THE

DISEASES OF THE SKIN

By LOUIS A. DUHRING, M.D.,

Professor of Diseases of the Skin in the University of Pennsylvania; author of "A Practical Treatise on Diseases of the Skin" and "Atlas of Skin Diseases."

PART I.

ANATOMY OF THE SKIN—PHYSIOLOGY OF THE SKIN—GENERAL SYMPTOMATOLOGY—GENERAL ETIOLOGY—GENERAL PATHOLOGY—GENERAL DIAGNOSIS—GENERAL TREATMENT—GENERAL PROGNOSIS.

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[OVER]



FROM THE PREFACE.

THE present work has been written to take the place of the author's former "Practical Treatise on Diseases of the Skin," which for several years has been out of print. The favorable reception accorded to that work by the medical profession everywhere, as attested by the many thousand copies published, by the press in this country and abroad, and by its translation into French, Italian, and Russian, has led the author to believe that a larger and more comprehensive treatise on the same subject might be equally well received.

The material dealt with in the present volume has on all sides been approached from a practical stand-point. It has been the aim of the author to adhere closely to the practical aspect of the subject, supported by science and by experience. The work, as a whole, rests on clinical observation supported by pathology and pathological anatomy. The principles of cutaneous pathology and therapeutics have been put forth upon conservative lines in the light of modern research and experience. The rapid strides that Dermatology has taken during the past decade have produced remarkable changes in the pathology of many of the diseases of the skin, but clinical observations are on this account none the less valuable and important.

An accurate knowledge of the anatomy and physiology of the skin aids greatly the understanding of the diseases which affect this organ. In like manner a comprehensive view of the general etiology and pathology of the integument assists the student in comprehending the meaning of the numerous and diverse manifestations which occur on the skin. For these reasons considerable attention has been bestowed on these topics, which may be regarded as the foundation-stones of Dermatology.

growth which, by its pressure, occludes, in whole or in part, the portal vein may be followed by the same result. Cirrhosis of the liver is undoubtedly the commonest cause of ascites. In this affection the liver is indurated, and its circulation obstructed by connective tissue in the interlobular spaces. This new-formed connective tissue is precisely similar to that which forms the scar after a wound, and, like all cicatricial tissue, is no sooner formed than it begins to contract, and continues to do so until its limit in this direction is reached. This contraction, as a matter of course, compresses the ramifications of the portal vein, and causes more or less obstruction to the flow of blood. Venous stasis of the portal radicles results and may be so great as to cause rupture of the vessels of the stomach or intestines, manifesting itself by hæmatemesis and melæna, or by enterorrhagia. It is only exceptionally that the venous stasis leads to rupture of blood-vessels. Still it does occur, and may be the first well-marked symptom of portal obstruction. Hæmatemesis or intestinal hemorrhage occurring in an intemperate man or woman should always excite suspicion of cirrhosis of the liver. In most cases of cirrhosis ascites is the first symptom which points to organic disease of the liver. All manner of gastrointestinal disturbances may have preceded the dropsy, but they are invariably attributed to "indigestion,"—and rightly so, but they are not, as is supposed, merely functional in their nature. On the contrary, they are the expression of grave organic disease. Now, in the case before us, the first symptom to alarm the patient was abdominal dropsy. It was for this he came into the hospital a few weeks ago. Whether or not this dropsy was preceded by digestive disturbances it is difficult to make out, for the man is an Italian and does not speak a word of English. The mere fact of his being an Italian is presumptive proof that he is temperate in the use of alcoholic liquors, and this is borne out by his *facies*. It is, I think, self-evident that this young man has not been a hard drinker. A former pathologist of this city, a man with unusual opportunities for observation, was in the habit of teaching that alcoholism was not the chief cause of hepatic cirrhosis, but such teaching is contrary to universal medical experience. A few years ago the effect of chronic alcoholism on the tissues was discussed at great length at the Pathological Society of London. This famous debate occupied three sessions of the society, and there was not a dissident from the view that cirrhosis of the liver is chiefly caused by alcohol. To hold the contrary is, in my opinion, the rankest kind of pathological heresy.

Our patient's age—he is but twenty-three—also affords evidence

against the view that the cause of his dropsy is hepatic cirrhosis, while his sex is in favor of it. It is true that cases have been observed even in children, but they are so rare as to be regarded as pathological curiosities. The late Professor Palmer Howard, of Montreal, reported two cases in children, and, after an extended search through the literature of the subject, succeeded in finding records of sixty others, but, as already stated, the disease in children and even in young adults is very rare.

The age of our patient and his temperate habits lead me to exclude cirrhosis, or rather, to doubt its existence.

Syphilis of the liver may be either congenital or acquired. Congenital syphilis probably accounts for many of the cases of hepatic cirrhosis in children. In cases of acquired syphilis of the liver there will be other external signs of the systemic condition, such as the cicatrix of the primary lesion, as well as the scars of secondary lesions, a history of cutaneous eruptions, sore throat, alopecia, osteocopic pains, etc. All these are absent in the case before us, so that I think we are quite justified in excluding syphilis.

Carcinoma of the liver is almost invariably secondary to carcinoma in some other organ, such as the stomach, pancreas, cæcum, and rectum. By the time, therefore, that it has involved the liver to such an extent as to give rise to ascites the patient is in a very cachectic condition; whereas, our patient presents none of the signs of advanced cachexia. Again, cancerous deposit in the liver always increases the size of the organ, sometimes to an enormous extent. A cancerous liver can almost always be felt projecting below the costal border, whereas, in our patient, no enlargement of the liver can be detected. Finally, our patient is too young to be suspected of cancer of the liver, which rarely occurs under forty years of age. We have now positively excluded cancer and syphilis of the liver, and rendered the presence of cirrhosis doubtful. The disease is probably not situated in the liver. Let us now search for it outside of the liver, and starting at its portal, we first have to consider thrombosis of the portal vein, pylethrombosis, as it is called. There can be no doubt that the most complete obstruction to the portal circulation is caused by thrombosis of the portal vein. This, however, never occurs as a primary affection, but is the result of pressure by new growths or enlarged glands in or near the hilus of the liver. It may also be the result of cirrhosis, occurring in the last stages of that disease.

Pylethrombosis may be positively excluded, since there is no evidence of abdominal tumor, and enlarged glands on the under surface

of the liver voluminous enough to compress the vena porta would almost inevitably obstruct the outflow of bile and give rise to jaundice.

We come now to discuss the question whether an affection of the peritoneum may have caused the effusion. Peritonitis, like pleurisy, is attended with more or less effusion, either serous or purulent, and it may be laid down as a rule applicable to both of these diseases that the amount of effusion is in inverse ratio to the acuteness of the inflammation.

Opinions are divided as to the existence of such a disease as acute idiopathic peritonitis, and certainly the great majority of cases of peritonitis are secondary to inflammation of cæcum, appendix vermiformis, and genital organs; still, in my opinion, idiopathic cases are occasionally seen, especially in rheumatic individuals and in those suffering from Bright's disease.

The case before us is certainly not one of acute peritonitis. The onset has been altogether too insidious to warrant such a supposition. Can it be one of chronic peritonitis? Chronic peritonitis is, I believe, always secondary to visceral disease. Such a form of inflammation is very apt to have its seat in the peritoneum covering the liver, and is known as perihepatitis. The peritoneum is often greatly thickened in this situation by inflammatory deposit, and the tendency to contraction on the part of the effused lymph is sometimes so great as to cause the anterior border of the liver to curl backward upon the superior surface of the organ. That this alteration in the shape of the liver is caused by the contraction of the thickened capsule is proved by the fact that when the capsule is removed the liver returns to its normal shape. Now, the compression exercised upon the liver by perihepatitis is quite sufficient to give rise to ascites. In fact, according to Fagge, it is a frequent cause of this symptom. According to the same authority, perihepatitis is generally associated with kidney-disease, whereas, in cirrhosis of the liver, the urine is generally normal. In order to apply these facts to the case before us we must first examine the urine. This, it is needless to say, has been done, and the urine was found to contain a decided amount of albumen as well as numerous hyaline and granular casts. Our case, therefore, closely resembles one of perihepatitis. Before deciding it to be such it is necessary to consider the remaining affections of the peritoneum which give rise to ascites. These are cancerous peritonitis and tubercular peritonitis. The objections to regarding the case as one of cancerous peritonitis are identical with those raised in discussing the question of cancer of the liver: 1,

it is generally secondary to cancer of one of the abdominal organs, those most frequently the seat of the primary disease being the stomach and ovaries; 2, it is exceedingly rare under thirty years of age, and, 3, it is decidedly more common in women than in men.

Cancer of the peritoneum may, I think, be excluded with certainty. There remains for our consideration tubercular peritonitis. This disease is insidious in its onset, abdominal pain being generally the first symptom complained of. There is usually tenderness on pressure, but this depends upon the seat of the inflammation. A favorite site is the under surface of the diaphragm, and, in such cases, tenderness on pressure may not be elicited. The most marked peculiarity of tubercular inflammation of the peritoneum is its tendency to transverse the diaphragm and attack the pleura. A concomitant pleurisy bears the strongest evidence in favor of the tubercular nature of a peritonitis, and *vice versa*. As a matter of course we now examine the chest, and we find marked dulness over the lower two-thirds of the left lung behind. In the same region the breath-sounds are extinguished, the voice distant and bronchial, and, at the upper limit of dulness there is well-marked ægophony. The signs of pleuritic effusion are unmistakable, and if further proof be needed it is found in the fact that the pulsations of the heart may be plainly felt and seen to the right of the sternum. Our patient has a cough which had been regarded as due to simple bronchitis until an examination of the sputum revealed the presence of tubercle-bacilli. The weight of clinical evidence, therefore, is strongly in favor of the case being one of tubercular peritonitis with secondary pleurisy.

I have thus far refrained from mentioning a remarkable symptom, or rather sign, which is present in this case, and which I believe to be pathognomonic of tubercular peritonitis. I refer to the distinct, circumscribed, erythematous zone which encircles this man's umbilicus. It is plainly visible from the remotest parts of this hall. You observe that the umbilicus, which is somewhat pouting from the pressure of the abdominal effusion, is, as first stated, surrounded by a broad continuous zone of erythema, and that, in addition, there are several discrete blotches of redness which show an evident tendency to become confluent with the above-mentioned zone. On account of the patient's dark complexion the redness is remarkably deep, almost of a copper tint.¹

I have seen this sign once before, in a case which resembles the one

¹ The appearance referred to is well represented in the colored plate.



Periumbilical erythema in a case of tubercular peritonitis.

before you in almost every detail. The patient was a young male, an Italian also, with ascites and pleuritic effusion and a periumbilical zone of erythema, much more extensive, but also much less vivid than that of our present patient. The case to which I refer was under my care in this hospital seven or eight years ago, and will, I am sure, be distinctly remembered by my then resident physician, Dr. Thomas G. Ashton.

I lay unusual stress upon the symptom under consideration, (1) because I believe it to be a pathognomonic one, and (2) because I have reason to think that few are aware of its existence. It is not referred to in any text-book of which I have knowledge, except that of the late Dr. Fagge, of London.¹ I believe it to be very rare, because I have seen it but twice in the course of seven years, but before I became acquainted with it I may have overlooked it, as I believe other hospital physicians are still doing. It is a sign with which surgeons, as well as physicians, should be conversant, as it may afford the former important indications, whether for operating or refraining therefrom.

Prognosis.—The diagnosis being arrived at beyond peradventure, what is to be said of the prognosis of tubercular peritonitis? It is by no means so grave as that of tuberculosis elsewhere. Many cases of tubercular peritonitis have recovered. The criticism may of course be raised that the diagnosis of these reported cases may have been faulty. This may be true with reference to some of the published cases, but such scepticism may be carried altogether too far. A remarkable case is recorded in which the tubercles on the peritoneum *were seen* and yet the patient recovered. It occurred in the practice of Sir Spencer Wells who made the erroneous diagnosis of ovarian tumor. On cutting into the peritoneum he perceived that this membrane was studded with miliary tubercles, and that there was no ovarian tumor. He at

¹ "Another sign of tubercular peritonitis is the existence of inflammation and thickening, and even of erysipelatous redness round the umbilicus. This may, perhaps, sometimes result from adhesion of the small intestine to the abdominal wall at this spot; for, in one case that I know of, a fæcal fistula resulted. More commonly, perhaps, it is caused by an extension of the inflammation of the parietal peritoneum to the surface along the track of the obliterated umbilical vessels."

Since making this statement I have ascertained that Quincke also refers to periumbilical oedema and redness as a sign of tubercular peritonitis, but does not regard it as pathognomonic, since, he says, it may be due to inflammation of the connective tissue around the umbilicus (*vide* Quincke, *über Ascites*, *Deutsches Archiv für klin. Med.*, Bd. xxx., 1882). While this is undoubtedly true, it does not detract from the value of the symptom in question, which derives its great diagnostic significance from its association with other symptoms. In the latter sense it may be regarded as the most certain sign of tubercular peritonitis.

once desisted from further operative measures and sewed up the wound. A sharp attack of acute peritonitis ensued, but the woman recovered, and six years later was in excellent health.

Treatment.—Last and most important comes the question of treatment, and unfortunately there is not much to say under this head. The recoveries that have taken place cannot be attributed to any specific plan of treatment. Fagge strongly advocates the application of mercurial ointment to the abdominal surface, believing that this has been productive of good results, especially in children. Others report success from the local application of tincture of iodine. The abdomen must be tapped if the accumulation of fluid in the peritoneum becomes so great as to give rise to pressure symptoms, and the same remark applies to the thoracic cavity. Thus far there have been no indications for tapping either of these cavities. In fact, the effusion in the abdominal cavity has diminished somewhat since the patient's admission. General supporting measures are, of course, indicated, and an occasional laxative to supplement by the bowels the deficient action of the kidneys which, as revealed by the examination of the urine, are the seat of chronic inflammation. No application has, as yet, been made to the abdomen, because I was anxious for you to see the zone of redness around the umbilicus. I do not feel that I have been negligent of the patient's interests by postponing such application, because I am by no means convinced of its efficacy. In this case I would prefer the tincture of iodine to the mercurial ointment, because the latter might cause salivation which I believe to be particularly injurious to one who is the subject of renal disease.

PLEURAL EFFUSION; PYOTHORAX; CHRONIC ARSENICAL POISONING, WITH THE MORPHINE HABIT; MITRAL REGURGITATION IN CHILDHOOD.

CLINICAL LECTURE DELIVERED AT THE JEFFERSON MEDICAL COLLEGE HOSPITAL.

BY HOBART A. HARE, M.D.,

Professor of Therapeutics and Materia Medica in the Jefferson Medical College, of Philadelphia; Physician to Jefferson Medical College Hospital.

GENTLEMEN,—The first case I show you to-day is that of J. G., a man under thirty, who presents himself with the history that two weeks ago he was taken with a violent pain in his right side near the diaphragm, accompanied by high fever and difficult respiration. After being ill for two or three days with these symptoms, he apparently began to convalesce; but at the end of a week presented himself at the Out-Patient Department complaining of cough, pain in the right side of the chest, and marked shortness of breath, which was increased on exertion.

On admission to the wards I found that he had, when he was sitting up, absolute flatness on percussion over the chest, both anteriorly and posteriorly, extending to the third interspace anteriorly and to the fourth interspace posteriorly. Careful percussion also elicited the fact that there was Skodaic resonance, and that the line of demarcation between the flatness and resonance was of that peculiar S-shape which was first pointed out by Garland, of Boston. Auscultation revealed a lack of all respiratory sounds on this side of the chest except close to the vertebræ, where, on a level with the seventh rib, there could be heard bronchial breathing and increased vocal resonance which amounted to ægophony, which you remember is the term applied to the peculiar bleating sound heard very frequently in cases of pleural effusion when the patient counts or makes any vocal sound.

The facts that the note on percussion is absolutely flat rather than dull, that there is absence of all respiratory sound, that there is decreased vocal resonance and fremitus, that there is bulging of the

chest and protrusion of the interspaces, and that the area of flatness varies somewhat as the patient changes his position, all point to the condition being one of pleural effusion rather than one of pulmonary consolidation.

There are several methods which may be resorted to for the removal of this fluid. In the first place, you should never forget that in a certain proportion of cases nature itself will cause the absorption of this exudate, particularly if the patient's general condition is greatly improved by proper diet and other forms of physical care. You should therefore always give time for the effusion to be absorbed before resorting to remedial measures for its removal. The administration of purgatives for the purpose of relieving such effusions is usually of little advantage. They deplete the general system, weaken the patient, and disorder his digestion. Diuretics are even more impotent for good, and diaphoretics are still less valuable. In my opinion, the physician who decides that a pleural effusion is remaining unaltered in quantity for any length of time should not wait for nature or for the possibilities of removal through the means that I have named, but should resort at once to aspiration, which can be readily performed, and which, with ordinary care, is practically without danger to the patient. Various points of election might be named for the insertion of the aspirating needle. Most persons, and I among them, prefer the sixth or seventh interspace in the axillary line, as this spot enables us to draw off practically all fluid in the chest without danger of wounding the diaphragm or the lung. Further than this, the chest walls in this area are easily penetrated because of their thinness.

While we are told that there is, theoretically, considerable danger of wounding an intercostal artery, and that to avoid this vessel we must keep as close as possible to the upper margin of the nether rib, I have yet to meet with such an unfortunate experience, or to have heard of one occurring in the practice of any physician with whom I am acquainted. The skin in the area to be punctured should be carefully sterilized, and then benumbed by the application of a small piece of ice, the tip of which is sprinkled with salt. The only care to be exercised is to see that no air enters the thorax, that the fluid is not drawn off too rapidly, and that syncope does not result. Should violent coughing ensue the tapping should be stopped, and if this symptom still persists, a hypodermic injection of morphine may be given to allay the cough, since excessive coughing, associated with rapid expansion of the lung, which has been compressed by the effusion, may

result in rupture of the vesicles and the development of hemorrhage. Unfortunately, these effusions are very apt to recur, and the greatest care should be exercised in using thoroughly antiseptic precautions when they are tapped, as each tapping seems to predispose to a change of the effusion from being serous to being purulent. We will now tap this patient, and, as you see, in the course of a very few minutes we have drawn almost a quart of a clear, straw-colored liquid from his chest, which we will have carefully examined bacteriologically, with the hope that it may perhaps give us some insight into the exciting cause of its presence.

Should the effusion not be tapped, through the refusal of the patient to submit to an operation, the next thing to be tried is the use of full doses of salicylate of sodium or salicylic acid, which has been found to be of very considerable value in these cases, causing a more rapid absorption of the fluid than any other medicinal means. The dose should amount to twenty grains at the least, given three times a day. Its employment is purely empirical, as we do not know how it produces the removal of the fluid. This method often fails even in serous effusions, and is useless if the effusion is purulent.

The second case is that of a man of twenty-three, who was discharged from the hospital ten days ago, convalescent from an attack of acute croupous pneumonia involving the apex of the left lung. The attack of pneumonia was mild,—at least in regard to the evidences of general systemic infection,—for at no time was the man seriously ill. He returned yesterday with the statement that he felt wretched, and that he had great dyspnoea on the slightest exertion, although he was fairly comfortable when sitting perfectly quiet in a chair.

An examination of his chest shows practically identical physical signs with those found in the case that I have just described, save that in the right-sided effusion there was displacement of the apex-beat of the heart towards the anterior axillary line, while in this case the heart was not displaced outward, but rather inward towards the epigastrium, as well as downward, and there was obliteration of what is known as Traube's semilunar space, which you will remember is a spot a little below the nipple, a little anterior to the anterior axillary line, in which in health you can nearly always develop on percussion a distinctly hyper-resonant or tympanitic note due to the accumulation of gas in the transverse colon just as it turns to descend. This space is obliterated by the descent of the diaphragm, which is pressed upon by the pleural effusion. The skin having been thoroughly cleansed and the aspirator gotten ready, I will now puncture the chest-wall in the

seventh interspace; and, to my surprise and regret, I notice that the fluid as it flows into the aspirating-bottle consists of pus, and not of serum. In other words, gentlemen, this man has had a pneumonia with a secondary infection of his pleural cavities, which infection may either be due to the bacillus tuberculosis or to the micrococcus lanceolatus, which, as you know, is the micro-organism of croupous pneumonia. Both these micro-organisms are capable of producing primary purulent effusions in the chest, and I will have this pus carefully examined to determine which of these two causes are at work. It is possible, but not probable, that some saprogenic organism may be the cause. The case practically from this time on passes from being a medical to a purely surgical one. Should the pus reaccumulate, as it is almost certain to do, you may either insert a large canula, and with or without aspiration allow the pus to escape. After it stops flowing pass through the large canula a soft fenestrated rubber tube, withdraw the metal canula, and make fast the external orifice of the tube to the skin by means of a safety-pin and an adhesive strip. This allows the pus to gradually drain into the antiseptic dressing which you apply. The patient should make deep inspirations and forced expirations several times a day to give the impaired lung gymnastic exercise and to expel the pus. Washing out the pleural cavity from time to time with mild antiseptic solutions is often useful, or you can turn the case over to the surgeon for immediate incision and drainage, the surgeon treating this abscess cavity in very much the same way that you would treat an abscess cavity elsewhere in the body. Should the pus be due to the bacillus tuberculosis, injections of iodoform and oil will prove exceedingly valuable.

The third case is that of a man of thirty-five, a Hungarian by birth, who, however, as is seen by his face, is naturally much lighter in color than many of his countrymen. On examining the skin of his chest, abdomen, back, and limbs you will notice that he is as brown as a very dark mulatto, although this discoloration is not uniform, but in blotches, some areas being much darker than others. There are also light spots scattered through the brown which are about as large as a pea, but even these are darker than the normal skin. In the folds of the groin the dark spots you will see have coalesced, so that the whole skin is as brown as coffee. As the case is an interesting one from several points of view, I asked Professor Stelwagon to see it with me, and he suggested the possibility of its being a pigmentation due to chronic arsenical poisoning, and very careful cross-examination reveals the fact that the patient has been in the habit for the last four

years of taking a prescription which contains benzoic acid, morphine, and arsenous acid in large quantities. Thus he has taken about one-fifth of a grain of morphine, with a twentieth of a grain of arsenous acid, four times a day for four years, and so has developed this very unusual and pronounced evidence of chronic arsenicalism.

He has no evidences whatever of peripheral neuritis, which would be an interesting complication, since arsenic taken for long periods of time frequently produces this lesion. Further than this, the presence of peripheral neuritis might be the cause of pigmentation of the skin. He has, however, a large abdominal effusion, probably due to malarial disease affecting his liver, as he has frequently suffered from malarial poisoning while in Florida.

The fourth case is that of a boy aged seventeen, whom I am sure none of you would take to be more than twelve or fourteen, both because of his immature appearance and his slight physical development. On stripping him you will notice that his arms are exceedingly thin and lacking in power; that the chest is also emaciated, and that the entire præcordium bulges with each systole of the heart, and that near the base of the heart there is a distinct presystolic thrill, which may be both seen and felt. On listening to his heart a very loud mitral regurgitant murmur is heard which possesses all the peculiarities in regard to character and time of mitral regurgitation, so that I shall not detain you with a description of this lesion, but rather emphasize one or two important points in regard to treatment. The first of these is that he must be given absolute rest in bed, in order that the ruptured compensation of his cardiac muscle may be recovered from; and as he is going to be put at absolute rest in bed, we can afford to regulate and quiet his irritable heart by the use of small doses of both aconite and digitalis. We will therefore prescribe for him two minims of the tincture of aconite and four minims of the tincture of digitalis every eight hours, and also place him upon a liquid diet for two or three days.

After the heart improves sufficiently we will let him out of bed from half an hour to an hour a day, gradually increasing this time of activity until he is up all day long.

It would be a mistake to give this boy general nutrients and active tonic treatment, with exercise, with the idea of improving his general physical condition. He is stunted because his heart is not strong enough to supply a well-developed child, and you can rest assured that just as soon as his heart is strong enough to supply a well-developed frame he will begin to grow and increase both in height and in girth.

PHANTOM TUMORS.

CLINICAL LECTURE DELIVERED AT THE GENERAL HOSPITAL.

BY ROBERT SAUNDBY, M.D. (Edin.), F.R.C.P. (Lond.),

Professor of Medicine in Mason College, and Physician to the General Hospital,
Birmingham, England.

GENTLEMEN,—The following case which is now under my care appears to be of sufficient interest to justify its selection for the subject of this morning's lecture.

Florrie F., a seamstress, aged eighteen years, was admitted into the General Hospital on May 3, 1895, complaining of a swelling in the right side of the abdomen, which she had noticed for the past ten days.

Her previous health had been fairly good except for a liability to suffer from bilious attacks, to which she had been subject as long as she could remember. About two years ago she had sharp pain in the left lumbar region which was very severe when sitting up, but disappeared on lying down. She has had several of these attacks of pain, but the last occurred two months before admission. On April 29 she noticed that her clothes would not come together easily, and on looking down she saw a swelling just below and external to the navel. On pressure it seemed to disappear in part and there was no tenderness. This swelling continued and she sought admission on that account.

Her family history shows that two brothers have had acute rheumatism, and one of them had chorea; a sister is described as "nervous;" there is asthma in her mother's family, and a maternal aunt suffers from hysteria.

On admission the patient appeared to be a slenderly-developed, poorly-nourished girl, somewhat anæmic. Her temperature was 98.8° F., pulse 80, and respirations 24.

Her appetite was poor; she stated that her bowels had been very confined, and that taking food was generally followed by nausea and flatulence, sometimes by vomiting. A test breakfast showed a deficiency of hydrochloric acid and a very distensible antrum pylori, so that the stomach when inflated reached below the umbilicus nearly to the hypo-

gastrium. On inspecting the abdomen an oval swelling was distinctly visible lying on the right of the middle line and reaching from the costal border to below the umbilicus. It was hard in consistence, felt very superficial, was not movable, but softened a little on gentle manipulation, and was resonant on percussion. When the patient was put under chloroform it disappeared completely, and did not return when she recovered from the effects of the anæsthetic, so that on May 18 she was discharged. The only medicine she received was the haustus magnesiæ sulphatis cum ferro, and a simple enema was administered the day after her admission.

The case therefore was one of what is called phantom tumor, and, as this particular variety is not very common and receives little notice in your text-books, I take this opportunity of bringing it under your notice, especially as in these days of active abdominal surgery there is some danger that you might repeat the mistake mentioned by Sir Thomas Watson, where the abdomen was actually opened for this condition.

This tumor was caused by spasmodic contraction of part of the rectus abdominis muscle. The contraction may affect the muscle on both sides, or similar tumors may perhaps be produced by localized spasm of other abdominal muscles, and indeed this may have been the case here, for the position and appearance of the tumor, as it was when I saw it and before its final dispersion, is not as it is described by Dr. Stead, and his drawing depicts the swelling too far to the right to have been caused by contraction of the rectus muscle.

It is strange that a condition which is not very rare should have received so little mention from writers of text-books, or even in special monographs on abdominal tumors. The only text-book which gives a correct description of this tumor is Pepper's "American Text-Book of Practical Medicine," and the only published case to which I can refer you is to be found in the following extract from Murchison's "Lectures on Diseases of the Liver," 2d edition, p. 26.

"CASE 7.—PHANTOM TUMOR OF ABDOMEN SIMULATING HYATID CYST OF THE LIVER.

"On February 17, 1869, Miss Hester D., aged eleven, a healthy-looking child, was brought for my advice as to tapping what was believed to be an hydatid of the liver. Two years before, on recovering from a low fever, a tumor had first been noticed in the epigastrium, which continued to increase for a year, and since then had been stationary. She had suffered from dyspeptic symptoms but not from

pain, and her general health had been good. There was a prominent rounded swelling extending from the lower end of the sternum to below the umbilicus, rather straight on either side, apparently from contraction of the recti muscles. It was for the most part dull on percussion; the surface of the enlargement was smooth and elastic but not fluctuating; there was no tenderness, except at one spot over the ensiform cartilage where the slightest pressure caused much pain. The degree of bulging varied somewhat according as the patient's attention was directed to it or not. On February 20 the child was put under the influence of chloroform; the tumor disappeared, and no tumor or enlargement of the liver could be felt. When the effects of chloroform passed off the tumor returned, but under the use of iron and belladonna it gradually diminished, and several years afterwards she was in excellent health."

The term "phantom tumor" is sometimes applied to an altogether different state of things where there is uniform enlargement of the abdomen from tympanites; a condition sometimes accompanied by development of the breasts and other signs of pregnancy. The following example of this second type occurs among my notes.

Mrs. B., aged twenty-three, told me that for fifteen months she had thought herself pregnant, but being at last convinced that that was not the case, she wanted an explanation of her condition. She had been married five years, and had had one miscarriage and one living child, born eighteen months before her visit to me. Fifteen months ago her periods stopped, she began to enlarge, was troubled by morning sickness, and by the eighth or ninth month her breasts swelled and contained a clear watery fluid. Recently menstruation had been re-established, but was scanty, and there was still occasional morning sickness. Her bowels were obstinately confined. On examination the abdomen was found to be much enlarged, but everywhere resonant on percussion.

This is the only kind described under the head of phantom tumor in either Quain's or Fowler's "Dictionary of Medicine;" it is usually mentioned in midwifery lectures as "pseudocyesis," and comes into the consideration of the diagnosis of pregnancy.

Florrie F.'s case completely misled our otherwise well-informed resident medical officers, who tell me they never before heard of such a condition; it is therefore probable that you do not know very much about it.

The symptoms associated with these tumors are liable to considerable variation, as the condition is often complicated by conscious or unconscious simulation of disease, and the bare outline of fact is amplified

by the morbid imagination with endless picturesque details. The tumor may be variously situated, but is generally in one or both straight abdominal muscles ; it is quite superficial, as if just below the skin, but in obese people this fact may not be so easily perceptible as it was in the present case ; it moves when the abdominal wall moves, but does not alter its position under the hand on respiration as would a tumor attached to the liver ; on gentle manipulation it appears to soften and become more vague in outline, especially if the hand is kept upon it while the patient is engaged in conversation ; it is resonant on percussion, though obesity may affect the certain determination of this point ; finally, it disappears when the patient is put completely under the influence of an anæsthetic, and the absence of any tumor may be established conclusively by the most thorough examination. In most instances we are able to be reasonably certain of the nature of the tumor by simple palpation of the abdomen while the patient is in the recumbent position. But in obese patients the difficulty of examination is great, and it is always better to make use of an anæsthetic not only in order to remove all trace of doubt, but because, as in this case, you may happily succeed in dispersing the tumor completely, and thereby effect not only a diagnosis but a cure.

These tumors, as already hinted, do not occur exclusively in hysterical girls or nervous women. Some years ago I met with a case in a middle-aged male out-patient whose club doctor wrote to me shortly after to say that he was strongly suspected of malingering. He had a tumor in the centre of his belly very like the top of an ordinary household loaf, the umbilicus standing for the depression which the baker's thumb imprints in the middle. It was square in shape with rounded edges, and it disappeared when his head and shoulders were lowered. He had a good many other symptoms which I have forgotten ; and as I refused to give him a certificate of disability he did not think it worth while to come again.

Palpation is the key to the diagnosis of diseases of the abdomen, yet a mastery of the art is not readily acquired. Its initial difficulty consists in the rudimentary state of the sense of touch of the uneducated hand, and this can be developed only by prolonged attention and practice. The chief obstacle to be surmounted by the palpating hand is the contraction of the abdominal wall. This is in great measure under the control of the patient, and becomes relaxed when her attention is withdrawn, so that we do all we can to reassure her, and engage her in conversation while meanwhile we lay our hand, which should be of a comfortable temperature, flat on the surface of the abdomen, and

press the palm into close contact with the skin, the fingers being kept motionless for the present. The hand so applied should be made to glide cautiously over the surface of the abdomen, the tips of the fingers being slightly curved so as to appreciate better any contours which the yielding muscles allow to be felt. The patient should be asked to breathe deeply and slowly, advantage being taken of the movements of the abdomen, to make the hand acquainted with the deeper parts of the abdomen, and note taken of any moving surfaces within the abdominal cavity. Recollect that only the liver and spleen move normally with respiration, and that any moving body is therefore part of or adherent to one of these organs. Note, also, if in any place the abdominal wall exhibits invincible rigidity, remaining "hard as a board," while the rest of the wall is soft; such a condition properly recognized is an infallible sign of a localized peritonitis, the cause of which you may or may not be able to determine from other sources, but the existence of which is absolutely certain, and constitutes, as a rule, a fact in itself of the highest practical importance.

The most experienced palpator may be baffled by extreme nervousness on the part of the patient, wilful resistance, or extreme obesity. We may try palpation in other positions instead of the ordinary supine posture; the patient may be made to lie prone, or to sit up, the palpator manipulating from behind; or we may adopt the genupectoral attitude. But our ultimate and most satisfactory proceeding will be to place the patient well under chloroform, until the abdominal muscles are thoroughly relaxed, when the educated and experienced hand no longer meets with any difficulties in exploring the contents of the abdomen. Do not imagine that the result is always absolutely certain, or that a diagnosis can by this means be assuredly made. But it is the best means we possess of approaching certainty, and an experienced hand will attain marvellous precision in its sense of touch. Let me urge you to cultivate this sense by taking every opportunity to practise palpation, and bear in mind that no abdominal operation should be undertaken without clearing up the diagnosis as far as possible by the use of an anæsthetic.

ULCER OF THE STOMACH.

CLINICAL LECTURE DELIVERED AT THE COLLEGE OF PHYSICIANS AND SURGEONS,
CHICAGO.

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GENTLEMEN,—The case before us you will remember to have seen at the last clinic. He presented himself at that time because of a certain pain in the stomach which not only interfered with his comfort, but, as it was increased after eating, was also interfering with nutrition,—the fear of the attendant pain causing him to neglect his meals. In order that we might make a more careful diagnosis he was asked to return to-day, and directions were given him to take the test-breakfast this morning.

An hour ago he took the test-breakfast, consisting of an ordinary roll and a glass of water, and appears now for examination. The patient is eighteen years old; there is no family history worthy of note. You observe that the tongue is slightly coated, the skin and mucous membranes are anæmic. He was in good health until a year ago. Six years ago he had typhoid fever. For two years he has been a salesman at a soda fountain, and has been accustomed to drink large quantities of soda-water. Less than a year ago he began to feel distress at times in the stomach, especially after taking food or irritating drink. The tenderness is at the tip of the xiphoid cartilage, over the seat of pain. He describes the pain as constant, but as growing worse after meals. He vomits. The vomiting somewhat relieves the pain, but not entirely. He has not had a hemorrhage from the stomach, at any rate not one of sufficient quantity to attract his attention. He has not observed the stools, so that we have no account of blood-stained fæces. The great anæmia present, however, would make us suspect hemorrhage. The

pain, vomiting, and sallow skin suggest ulcer or malignant disease. You observe that no tumor is perceptible in the epigastric region; still cancer is sometimes present and no tumor may be discovered. The doubt on this point can be dispelled by a chemical analysis of the stomach-contents. If cancer is the cause of all the distress and nutritive disturbances in this case, in all probability no hydrochloric acid will be found,—it will certainly not be increased. If ulcer is the disease, then the hydrochloric acid will be present, and perhaps increased.

I introduce the tube we usually use for this purpose—the soft-rubber tube of Cohen—and find about one ounce of fluid in the stomach. (Stomach-tube is introduced, contents withdrawn, and tests made in presence of the class.) You see that the Günzburg test is positive, and so are the tropæolin and Congo-red tests. Dilute the contents with an equal quantity of water; the reaction of Günzburg's test is still positive; dilute again with an equal quantity of water; again dilute. The test still remaining positive, we test for the actual per cent. of HCl. Blue litmus shows that the reaction is acid. Put ten cubic centimetres of the stomach-contents into this test-tube. From the graduated burette add decinormal hydrate of soda solution carefully until litmus paper shows that the contents are just neutralized. It requires eight cubic centimetres of the soda solution to neutralize ten cubic centimetres of stomach-contents. One cubic centimetre of decinormal soda solution represents 0.03646 HCl. Multiply 0.03646 by 8. This reduced to percentage gives .29 per cent. HCl. As the normal percentage lies between .14 and .24 per cent., our specimen shows an excess of hydrochloric acid. This leads us to conclude that our case is one of *gastric ulcer*.

This is sometimes called round ulcer of the stomach, peptic ulcer, and often simple ulcer of the stomach. It consists in a solution of continuity of the mucous membrane, and often of the deeper layers of the parietes of the stomach, with more or less destruction of tissue. It is usually round or oval in form, but sometimes ragged in outline. The edges are generally clean-cut, especially when recent, and often look as if the ulcer had been "punched out."

Etiology.—Ulcer may occur at any age, perhaps most frequently between twenty and thirty years, but with considerable uniformity from twenty to sixty. It very often occurs in younger persons, as in this case. Statistics seem to indicate that males are more likely to suffer with ulcer than females. It occurs most frequently in males between thirty and forty; in females between twenty and thirty. Da Costa and Welch say that Americans are less susceptible to ulcer than

the English and Germans. On account of the depraved conditions of life and nutrition, the anxiety, depression, exposure, lack of fresh air, and damp dwellings of the poor, they suffer more with ulcer than the rich and well-to-do. Certain occupations, as cooking, weaving, tailoring, and shoemaking, seem to predispose to this disease. Mechanical injury of the mucous membrane of the stomach, as probably has occurred in our case, chemical injury from poisons, and similar traumas, act as causes of ulcer. Certain bacilli, especially the bacillus tuberculosis, may have a similar action, but may cause obstruction of a vessel, and ulcer result from disturbance of the local circulation. Such cases, however, if occurring in a patient who has tuberculosis, cannot be considered in the present connection. A very important cause of simple ulcer is anæmia, especially the form termed chlorosis. Certain diseases of the heart and blood-vessels, as atheroma, amyloid degeneration, endarteritis obliterans, may lead to peptic ulcer. Ulcer sometimes results from chronic passive congestion of the stomach in cases of cirrhosis of the liver. Persistent vomiting, malaria, parasites,—as trichina spiralis, diabetes mellitus, abuse of alcohol, and extensive burns of the skin,—may all give rise to ulcer of the stomach.

Pathogenesis.—A study of the pathology of gastric ulcer requires that we recall the causes of the disease and its methods of origin. In corrosive poisoning—the origin is readily understood—the part is suddenly destroyed. In the case of injury of less severity, and in irritation, a congestion is produced and an ulcer results from excessive desquamation of the epithelium. In obstruction of blood-vessels—*e.g.*, embolism—the nutrition of the part is destroyed, and the succeeding degeneration leaves an ulcer. If there is a tendency for the vessel or vessels to degenerate centrally, or if a succession of embolisms occur, an eroding or enlarging ulcer results, and healing is prevented or delayed. This result will follow whether the obstruction be in the smallest arterial twigs running up from the submucosa between the glands of the mucous membrane, or whether it be from atheromatous, amyloid, or aneurismal degeneration of the vascular walls. After a vessel has been plugged, it is possible that the action of the gastric juice on the part deprived of nutrition may hasten the formation of an ulcer; especially in cases of the hypersecretion of hydrochloric acid, which may dissolve the necrosed tissues. Other cases, however, especially in the young, cannot be explained in this manner. Here we may assume that follicular hemorrhages and hemorrhagic erosions act as the cause of the ulcer, just as hemorrhagic infarcts do on a larger scale, by interfering with the nutrition of certain areas of the mucous membrane.

In such cases the ducts of the glands are packed with blood-cells to the fundus. Many punctate-appearing follicular hemorrhagic spots, varying from the size of a millet-seed to a pea, may occur, and the loosened mucous membrane frequently suffers erosion. Large ulcers may thus originate, especially near the pylorus. In the first instance this erosion is merely a necrosis of tissue, but eventually the character of the pathological change is altered, a proliferation of young cellular elements occurs, spreads to the deeper tissues, continually throwing more elements to the surface, and a true ulcer is formed. It is seen from this that an ulcer does not enlarge actively, but its growth is the result of the necrosis. In these cases the active process is the stage of proliferation with the formation of cicatricial tissue and healing.

In older ulcers the margins are thickened by a reactive inflammation at the periphery, forming a callous outline. In the fundus of the glands thus obstructed—that is, those glands which have been packed with blood-cells—the epithelium and peptic cells undergo marked changes. In place of peptic cells, cuboidal or cylindrical epithelium is formed. The peptic cells are shrunken and separated from one another and the membrana propria; their contents are broken down and assume almost the appearance of hyaline degeneration. Single ducts undergo cystic degeneration. A rich vascular net-work, with an abundant small-celled infiltration, makes the submucosa decidedly broader and thicker. On account of these central necrotic and peripheral active processes the base of the ulcer may become firmly attached to the underlying tissue, and the mucous membrane at the margin becomes inverted into the ulcer. In the same manner the ducts of adjacent glands may become so bent that their mouths are turned towards the ulcer, and thus pour their secretion, if there is any, directly into it.

Reference has already been made to the hypersecretion of HCl in gastric ulcer. Korczynski and Jaworski have found that in the majority of cases this occurs, and that the acidity increases with the degree of severity of the subjective and objective symptoms, reaching its height at the time of hemorrhage. The secretion is independent of food-taking, and returns to normal with recovery. They conclude that in chronic gastric inflammation both the central and parietal cells are increased in number, and that there is a consequent increase of both acids and ferments. The central cells, being less resistant, succumb beneath this abnormal activity, but the parietal cells survive and continue to secrete HCl from the chlorides of the blood.

One other possible interference with the circulation is spasm of the muscular coats of the stomach in vomiting and gastralgia, with com-

pression of the veins. It is possible, also, that micro-organisms may cause ulcer by obstructing minute vessels, thus interfering with nutrition and inducing necrosis of tissue.

Sometimes there is no tendency to healing, but the corrosion steadily progresses until the coats of the stomach are perforated.

Pathology.—Ulcer of the stomach is usually single; often two or three may occur; rarely larger numbers are found. Berthold mentions a case with thirty-four, and others have reported even larger numbers. Brinton states that multiple ulcers occur in about one-fifth of the cases. The usual position is upon the posterior wall of the pyloric portion of the stomach on or near the lesser curvature, or those locations most easily affected by the gastric juice. The cardiac extremity is least frequently involved. The female sex seems to be most frequently affected by this malady, statistics showing that nearly twice as many cases occur in women as in men. The size of the ulcer varies. Follicular ulceration or erosion may occur in the stomach, especially after burns, where the ulcer varies from the size of a millet-seed to that of a pea. They are common accompaniments of dilated stomach, and they may be the cause of fatal hemorrhage. Ordinary ulcers often attain a large size, sometimes two inches in length. Ulcers vary, then, in size from that of a millet-seed or pin-head to one and a half or two inches in diameter; but larger ulcers than this have been reported by Cruveilhier and others. The average size is about that of the quarter-dollar. If small ulcers coalesce, a ragged outline may be seen instead of the usual clean-cut appearance. The loss of substance is usually greater in the mucous membrane than in the submucosa, and in this layer than in the deeper tissues, hence the form of the ulcer is often crater-like or funnel-shaped. The various layers of the gastric walls can often be distinguished in the ulcer by the varying extent to which they are eroded. The walls of the ulcer may be vertical. Virchow says one side may be vertical and the other terrace-like. Swelling and blood-cell infiltration often occur, so that the margins are indurated; especially is this true in old ulcers. The direction of the axis of the ulcer, according to Orth, may not be perpendicular to the mucous surface, but may be obliquely directed like the gastric arteries. This gives color to the theory that gastric ulcer may be caused by embolism in local arteries. This view has been demonstrated experimentally upon animals. Pannam and Cohnheim have shown that emboli driven into the gastric arteries of the dog produced characteristic ulcers in the mucosa, and the funnel-like manner in which the coats of the stomach are successively destroyed would indicate, as pointed out by Virchow, that the ulcer corresponds

to the expanse of an artery supplying the mucous membrane. The base of the ulcer is formed by one of the layers of the gastric parietes, unless perforation has occurred, in which case the base may be formed by the liver, the pancreas, or some other organ. Opposite the ulcer the serous coat usually shows a patch of fibrinous lymph, which forms the attachment to adjacent tissues in cases where adhesions occur. This work of nature frequently prevents the escape of the ingesta into the abdominal cavity, although the entire gastric wall may have been pierced by the ulcer. In recent ulcers the base may be smooth and firm, soft, irregular, hemorrhagic, devoid of granulations, and free from pus. In old ulcers, however, the base is often anæmic, even indurated, the edges hard and elevated from the development of new connective tissue. The tissues in immediate proximity to recent ulcers contain granular detritus, consisting largely of remnants of connective-tissue fibres, disintegrated red blood-corpuscles, and fatty granules. This granular matter often compresses the tubules and separates them from one another. Around the margins of this granular detritus is occasionally found a band of tissue infiltrated with lymphoid cells. The walls of the blood-vessels in the newly-developed connective tissue are thickened by endarteritis or atheroma. Some of the blood-vessels may contain thrombi. The new tissue may develop in the mucous membrane around the ulcer for some distance, and compress or obliterate the gastric tubules, and cause inflammation and atrophy of the nerve filaments. The evidences of hemorrhages may be seen in the eroded blood-vessels. Serious hemorrhages occur in about one-third of the cases, and generally result from erosion of the splenic, pyloric, coronary, gastro-epiploic, or gastro-duodenalis vessels; but a dangerous or fatal hemorrhage may occur from erosion of the hepatic, pancreatic, and mesenteric vessels, or from varicose gastric veins.

Ulcers of the stomach often heal spontaneously, becoming permanently united to an adjacent organ, as the liver or the pancreas, or some other neighboring tissue. The floor is covered by cicatricial tissue, and usually assumes a stellate shape, the contraction of which often produces deformities of the viscus or obstruction of the pylorus. If the former occurs, the organ may be divided into two parts of unequal capacity; if the latter, dilatation of the stomach results. The method of healing resembles that of a typhoid ulcer. The edges are bound down to the cicatricial floor, but the mucosa is never repaired. The epithelium, according to Hamilton, may never cover the floor, and if it does it produces a very thin layer. The time required for healing probably varies. In my own practice I have

found that when recovery occurs, the cure sometimes seems to be accomplished in three or four weeks, while other cases require a longer time. Cohnheim found that when ulcers were produced experimentally in animals, complete healing occurred in three weeks. The cicatrices, contractions, and distortions following ulcers are sources of great annoyance in after life. Dyspepsia is common, and dilatation may result with its attending symptoms.

Perforation may occur. The liability to this accident diminishes with age, occurs more frequently in the female than in the male, and between the ages of fourteen and thirty than at any other period. If the perforation occurs suddenly and, as is usual, the ulcer is situated on the anterior wall, the stomach-contents may escape into the peritoneal cavity, producing a rapidly fatal peritonitis. If the perforation takes place slowly, the fibrinous exudate in front of the ulcer, which has already been mentioned, causes adhesions with neighboring tissues, and a new floor for the ulcer is formed. It sometimes happens that the ulceration may continue, and thus involve adjacent organs, more especially the liver. The ulcer sometimes opens into a cavity,—the pleura, the mediastinum, the pericardium, the lung, the left bronchus, the gall-bladder, the large or small intestine, etc.

Symptomatology.—The clinical history of ulcer of the stomach presents marked differences according to the severity of the lesion and probably the temperament of the patient. In many instances it seems to be latent throughout the entire course, at least attention is not drawn to any characteristic symptoms during life, and the cicatrix seen at the post-mortem is the only evidence that the stomach has been affected by this lesion. In cases which come under the care of the physician, the symptoms vary from slight disturbances to such excruciating suffering and alarming hemorrhages that the best-directed efforts of the physician cannot avail to save the life of his patient.

The classical symptoms of ulcer of the stomach are pain, vomiting, hemorrhage. They vary in their relative importance as they do in severity in individual cases. The symptoms first manifested in an ordinary case of ulcer may be so indefinite as to be mistaken for some simple digestive disturbance. Vague sensations of fullness, tension, or pressure, transient dull or drawing pains, and fitful or variable appetite are experienced. In ulcer, however, the tongue is clean, or at any rate usually only slightly coated at the base. The curtailed diet is not always due to diminished appetite, but frequently is a precaution against pain which has been observed to be more marked after a full meal. This restriction of diet soon causes emaciation, as in our patient,

anæmia, and consequent loss of strength, together with functional disturbances of digestion.

The epigastric pain is cramp-like, and gradually becomes localized to a definite spot corresponding to the seat of the ulcer. This spot is usually in the lower half of the stomach. It must not be understood that the pain is localized with exactness, but it is generally referred, as in this case, to the infrasternal depression. Tenderness over the epigastrium is common, especially when subjected to pressure, hence tight lacing and tight trouser-bands cannot be borne. The pain may be continuous, as shown in this case, or intermittent, dull, and gnawing, boring or lancinating, often radiating to the back or neighboring organs. Diffuse pains may occur in other diseases. The pain which is characteristic of ulcer is circumscribed, boring or gnawing, epigastric or dorsal, or both, appearing soon after taking food, and disappearing when the food has been removed by vomiting or passing into the duodenum. Often patients complain of "stitches in the side." A change of position will sometimes relieve the patient. This is suggestive of mechanical irritation by the food, as the cause of the pain. The irritation is produced also by the presence of gases and acids, the result of digestion and fermentation. Stimulating articles of food cause greater pain, bland food less. That fermentation and other acids often cause pain is shown by the relief which the administration of alkalis will sometimes afford.

Vomiting is a cardinal symptom of gastric ulcer, and usually supervenes soon after meals. It may occur several times a day, or only once or twice a week. The character of the egesta varies. Soon after a meal it consists mainly of particles of food with little or no digestive change. It may be mixed with blood and mucus. At other times there may be a mixture of fermentation fungi, bacteria, sarcinæ, remnants of food, mucus, blood, bile, etc. The emesis is generally preceded by pain, and is followed by relief or alleviation of the discomfort. Occasionally vomiting occurs without premonitory discomfort, and, as already indicated, does not depend entirely upon taking food. It is sometimes due to accompanying gastritis. It may persist after the cicatrization has taken place.

Hemorrhage or *hæmatemesis* occurs in twenty-five per cent. or more of all cases. Brinton gives twenty-nine per cent., Gerhardts forty-seven per cent. Many hemorrhages are so slight that vomiting is not caused, and if the blood is digested no change is seen in the color of the stools. Large hemorrhages which are not followed by emesis cause blood-stained, pigmented, or tarry alvine evacuations. If hæmatemesis

occurs after a moderate gastrorrhagia, the blood is generally acid, coagulated, and has a tarry or coffee-ground appearance, due to the action of the gastric juice upon the red corpuscles and proteids of the blood. If the hemorrhage is very profuse, the gastric juice may not affect the blood, the reaction may be alkaline, and the color arterial. The blood thrown up in the vomited matters, and that evacuated by the bowels, may occur in such small quantity—as may occur in the case of our patient—that it can be detected only by chemical, microscopic, or spectroscopic examination. It is only by such means that the cause of some obscure anæmias is discovered. The quantity of blood may vary from a mere trace to several pints. Fatal collapse occurs because of profuse hemorrhage in about four per cent. of all cases. After hæmatemesis, melæna may persist for several days. Waxy pallor of skin, small rapid pulse, mild febrile movements, anorexia, ringing in the ears, vertigo, mild delirium, and loss of consciousness may occur. Subsultus tendinum and spasm in the extremities may occur. Patients usually rally rather rapidly after hæmatemesis. Still the effect upon the mind of the patient may retard recovery. There is often fear of a return of the hemorrhage, and we know that the fear is well founded. Another may occur in a few hours, in weeks or months, sometimes not for years after, and at a time when the patient least expects it. Not infrequently there is a premonition of the threatening hemorrhage, in the form of flashes of heat, epigastric pulsation, fulness in the stomach, and great restlessness. It sometimes happens that the first indication of gastric ulcer is an alarming hæmatemesis, resulting from the erosion of a large vessel. Here, as under other circumstances, death may result suddenly.

Perforation is a most alarming complication of ulcer, when it occurs. It takes place into the peritoneal cavity in six or seven per cent. of all cases, and is then usually rapidly fatal, either from shock or acute peritonitis. If the perforation is small, a localized peritonitis may occur, followed by adhesions to and abscesses in neighboring organs and tissues, the fatal termination being delayed. The accumulation of pus in these organs and cavities may produce inflammation, and usually causes death by exhaustion. If the perforation occurs into the colon or intestines, fæcal matter may be vomited, or lenteric diarrhœa may result. In fortunate cases adhesions take place with adjacent organs or tissues, and death is prevented, at least for a time. When such a result follows, the patient experiences various symptoms of dyspepsia, and may suffer from localized pains or sensations of distress. As a rule, however, the perforation occurs suddenly and without warning. It

may follow a fit of coughing, lifting, straining at stool, leaning over a table, riding, a blow on the stomach, or eating a hearty meal. Suddenly severe pain is felt in the abdomen, and collapse may result. Sometimes distention of the abdomen, severe pain on the slightest touch, vomiting, hiccough, small rapid pulse, and pinched features—the facies Hippocratica—indicate the fatal accident. Perfect recovery after perforation is exceedingly rare. Healing after ulcer is by cicatrization, and, as already described, may produce various contractions and distortions of the stomach. These modifications of structure and shape cause a host of dyspeptic symptoms, reminding one of nervous or functional dyspepsia, cancer, or gastritis. In fact, cancer may originate in such cicatrices, and gastritis is not a rare complication. They not infrequently elude diagnosis, and resist all efforts at treatment.

Syphilis and tuberculosis, when the cause of gastric ulcer, present constitutional symptoms which will aid in the diagnosis.

Diagnosis.—It should be remembered that the characteristic symptoms of gastric ulcer are *pain*, with epigastric tenderness, usually increased after meals; *vomiting*, usually preceded by pain; *hæmatemesis*. If all these symptoms are associated in any case, there may be no mistake in diagnosis; but if only one or two should be present, as in our patient, the case may be mistaken for other diseases. For instance, pain may occur in functional dyspepsia when associated with gastralgia or gastrodynia, in chronic gastritis rarely, and in cancer. It may be mistaken for the pain of gall-stones or renal calculus, intestinal neuralgia, etc. If the pain is due to gastralgia, it will not occur regularly after meals; it may arise from nervous disturbance or annoyance, or it may come on without any exciting cause. It is often relieved, however, by vomiting, but the vomited matter has not the characteristics of that in ulcer. The pain in gastralgia is relieved by pressure, in ulcer increased. The age of the patient may be of value in determining whether the pain is due to ulcer or to gastrodynia. Ulcer is most frequent under thirty, gastrodynia or gastralgia above that age. It must be remembered that gastralgia and ulcer may exist together. The tenderness over the epigastrium in ulcer is not common in functional dyspepsia with gastralgia. All the symptoms must be weighed in obscure cases. If this is done, the character of the pain may be sufficient to suggest a diagnosis. Under such circumstances the localization in the epigastrium of a boring, gnawing, drawing, lancinating pain, which radiates to the back or adjacent organs, *without tumor*, occurring chiefly or only after meals, and relieved by vomiting, may be considered as indicating ulcer of the stomach, provided the vomited

matter shows no cancer cells. The pain of gall-stones may frequently cause a mistaken diagnosis; but this should usually be when the patient is first seen. A study of the history of the case, the sudden cessation of pain, examination for discoloration of the skin and conjunctivæ, with a careful examination of the stools for the calculus, should prevent mistake. If care be taken, the pain of renal calculus should not be misinterpreted for that of ulcer of the stomach. Neuralgic pains in the intestines are not relieved by vomiting nor increased by eating. Only in those cases where such pains occur in the course of subacute or chronic gastritis should they cause hesitation in diagnosis. Pain, as well as all other symptoms, is less severe in chronic gastritis. The pain of cancer is continuous, and not relieved by vomiting, nor especially increased by eating. The vomited matter contains cancer cells and broken-down tissue, and hydrochloric acid is usually absent, while in ulcer it is generally increased, and the chemical examination should be made in obscure cases. The vomiting of ulcer is not especially characteristic except that it is usually preceded by pain, which is relieved by that act. Vomiting may relieve the pain of gastralgia, but other symptoms should enable the physician to distinguish between them. The vomiting of cancer, as already stated, does not relieve the pain, and brings up materials which are pathognomonic,—cancer cells, detritus, etc.

Hæmatemesis is the most important symptom in diagnosis. A profuse hemorrhage from the stomach in a young person is always suggestive of ulcer. Even in large hemorrhages the blood is sometimes discharged by stool. In the absence of hemorrhage the diagnosis is nearly always uncertain, hence the necessity for examining the alvine evacuations if hæmatemesis has not occurred. It is necessary to distinguish between hæmatemesis and hæmoptysis. In the latter the blood is generally brighter, and the admixture of air presents a frothy appearance. Hæmoptysis usually occurs with a sensation of tickling in the throat, irritation, cough, or a sensation of warmth in the chest, while hæmatemesis is usually preceded by some sensation in the *stomach*,—nausea and a tendency to vomit. It must be remembered that hemorrhages from the stomach occur vicariously in some menstrual disorders; they occur also in purpura hæmorrhagica, scurvy, hæmatophilia, miliary aneurisms, progressive pernicious anæmia, malaria, yellow fever, and the exanthematous fevers. But in all these maladies a careful study of the case will enable one to make a correct diagnosis.

In any case where there is doubt the use of the stomach-tube to secure the stomach-contents is justifiable. If gastric ulcer is present, the usual tests will show an excess of HCl. Hydrochloric acid in

excess may occur in certain neuroses, but other means of diagnosis will make the distinction clear.

Prognosis.—It has been estimated that about fifteen per cent. of all cases of gastric ulcer recover; the more superficial and recent offering the best prospect for this favorable result if the patient is in good condition and proper treatment be adopted. It is encouraging to know that such good results have been obtained in the past, and we have just ground for belief that better results may be reached in the future with modern means of diagnosis and methods of treatment. Osler believes that in uncomplicated cases the prognosis is more favorable than in chronic catarrhal gastritis. Even after a hemorrhage which does not immediately prove fatal, according to Ewald, the prognosis is on the whole favorable. Scars are found post mortem about twice as often as ulcers. This would indicate that the per cent. of recoveries by cicatrization is greater than formerly occurred. But the scars themselves are sources of danger, the constant irritation and contraction, the interference with digestion, and discomfort due to dyspeptic symptoms combining to reduce the patient's vitality and shorten his life. The prognosis for a cure in old ulcers is less favorable than that for those of recent development, like the one before us. Brinton has reported one that was open for thirty-five years; others varying from fifteen to thirty years have been reported. Continuous pain, irrespective of the introduction of food, is an unfavorable symptom, and points to a complicating inflammation. The possibility of cancer originating at the seat of an ulcer will frequently render the prognosis uncertain. It must ever be borne in mind that relapses may occur.

Treatment.—The successful treatment of gastric ulcer rests in meeting the following indications:

1. Relief of urgent symptoms.
2. Removal of the cause.
3. Giving rest to the stomach.
4. Regulation of diet.
5. Aiding general metabolism.
6. Correcting the altered condition of blood.

The urgent symptoms are (a) pain, (b) vomiting, (c) hemorrhage, (d) perforation.

1. (a) The pain may be so excruciating as to require a hypodermic injection of morphine and atropine at once, gr. $\frac{1}{4}$ to gr. $\frac{1}{2}$ or more of morphine, and gr. $\frac{1}{160}$ to $\frac{1}{80}$ or more of atropine. If the pain is not too severe, a dose of Epsom or Rochelle salts, to hasten the emptying of the stomach, may afford relief. The danger of concurrent hemorrhage

contra-indicates emetics. Lavage may be used in selected cases, but only soft tubes should be employed, and the fluid should be removed by aspiration, not by Ewald's expression method. If the pain has subsided when the physician is called, attention to diet and rest, as directed under the third and fourth indications for treatment, will often be sufficient. The removal of all irritation is necessary to secure relief from pain. Sometimes it is advisable to give anodynes by the mouth. Morphine or opium give the quickest relief usually. If for any reason these cannot be borne or ought not to be given, conium, cannabis indica, belladonna, and other drugs may be used.

(b) Vomiting, which generally accompanies and often relieves pain, may sometimes be prevented or ameliorated by the use of bits of ice in the mouth, free doses of subnitrate of bismuth alone or combined with oxalate of cerium. Four grains of the former and one of the latter may be used every half hour or hour until relief is obtained. Bismuth and opium, or bismuth and morphine, are often combined with excellent effect. To prevent the return of vomiting, regulation of the diet is of first importance. Bismuth may be given in five- to ten-grain doses four times a day for several days or weeks. Sometimes larger doses are required. Nitrate of silver is a remedy of considerable reputation in this disease, and often seems to prevent or delay paroxysms of vomiting. This drug may be given in doses of $\frac{1}{4}$ to $\frac{1}{2}$ grain, three or four times a day. The action is probably localized to the point of lesion, but in cases of general hyperæmia of the gastric walls, the effects of this remedy and bismuth may be more quickly realized.

(c) The treatment of hæmatemesis may be general or local. In severe cases a subcutaneous injection of ergot may be required. If I do not have a solution specially prepared for hypodermic use, I do not hesitate to use the fluid extract in doses of eight to fifteen minims in cases of emergency. When the hemorrhage is passed, ice, bismuth, and nitrate of silver, as recommended for vomiting, may be used to prevent return. The most essential element in the treatment at this stage is rest in bed. The patient must be kept absolutely quiet. Washing out the stomach with ice-cold water is sometimes required as the only means of checking an obstinate hemorrhage, but the precautions before suggested (a) must be scrupulously observed. If the patient is very nervous and morphine has not been administered to control previous pain, small doses may be given alone or combined with ergot hypodermically. I usually give ergot for several days by the mouth to prevent the return of hemorrhage. If dizziness or oppression result from the administration of the drug, I reduce the dose. I prefer to give three or four

minims every two or three hours, but frequently give it every hour in two or three minim doses for two or three days, and then lengthen the interval.

(d) Perforation requires prompt treatment. Stimulants by the mouth or hypodermically should be administered at once. Camphor and ether, wine, brandy, or whiskey in cases of collapse are urgently demanded. If adhesions occur or have occurred and reaction follows, nux vomica and other "stimulating" tonics should be prescribed. If peritonitis supervenes, large doses of opium must be given in suppository or enema, and ice-cold applications made to the abdomen. If the stomach is full, or if there is doubt in regard to it, the stomach-tube must be used at once to empty the viscus, if possible. The object is to encourage adhesions by localizing the inflammation, and thus save the patient.

2. The second indication, the removal of the cause, is frequently more difficult to meet. If hot food or drink, or irritating food or drink, as in this case, is the cause, it must be interdicted. If *aræmia* is the cause, attention must be given to that. If atheroma of blood-vessels or aneurism be the original morbid condition, there is less hope of successful treatment. If necessary, occupations, as those of cooks, shoemakers, tailors, and the like, must be abandoned. Beer-drinking, indulgence in wine, whiskey, strong condiments, and other habits which irritate the stomach, must be inhibited. The prolonged and excessive use of soda-water must be restricted, and the habit of eating chalk, slate-pencils, and other indigestible materials, so common among chlorotic girls, should be prohibited. Remembering the belief expressed above that a failure in nutrition and local obstruction of the circulation occurring with hypersecretion of hydrochloric acid is the chief cause of ulcer, the maintenance of a liberal diet and the correction of hyperacidity will be suggested as the rational treatment where an attempt is made to remove the causal factor.

3. The third indication in the treatment of ulcer of the stomach is functional rest. The rest-cure as applied to the stomach may require absolute rest in bed and a total abstaining from the administration of food in the usual way. In cases of hemorrhage we have already seen that rest in bed is necessary. On account of great exhaustion and the danger of a return of hemorrhage, it is frequently necessary to prolong this rest. It often happens that rectal alimentation is demanded, because the stomach will not bear the presence of the irritating food without pain, vomiting, and hemorrhage. If resort must be made to rectal alimentation, two or four ounces of concentrated beef-tea or cream

should be injected into the bowel every three or four hours, depending upon the condition of the patient, and the sensitiveness of the anus and rectum, to determine the frequency and quantity.

4. The regulation of the diet, mentioned here as the fourth indication to be met, is of the utmost importance. All irritating articles of food should be avoided. Food taken by the mouth must be bland. Milk, raw or sterilized, and partially or completely predigested, as the condition of the patient indicates, should constitute the chief diet. Peptonized beef-tea and egg, artificial foods prepared from milk or the cereals, and water in moderate quantities, may be allowed. Large meals and large quantities of water must be avoided until recovery seems to be complete. The enlarging of the dietary list should not be permitted usually under three or four weeks. After that time, in favorable cases, fish, fowl, and starchy foods may be gradually added. Carlsbad and other alkaline waters may be useful. Alcoholic and malt liquors ought to be prohibited.

5. Aiding general metabolism is accomplished by scrupulously carrying out (4) what has been said in regard to diet, by using all the means at our disposal to assist digestion, and by the administration of tonics. Malt, iron, nux vomica, quinine, arsenic, and the vegetable stomachics serve an excellent purpose. General massage, electricity, lavage, fresh, pure air, sunshine, out-door exercise, and pleasant surroundings will hasten a cure after convalescence is fully established. Residence by the sea-shore, surf-bathing, and nutritious food will generally serve to restore the natural metabolic processes.

6. If an altered condition of the blood is at the basis of the formation of gastric ulcer, as believed by Ewald and others, an early attempt to correct this morbid condition is imperative. It has been found that potassium is deficient in the blood in these cases. Such being the case, those foods—vegetable—which contain this agent in comparatively large quantity should be allowed as early as practicable. The administration of carbonate of potassium, in view of the condition of the blood, would seem to be a rational element in the general treatment. The albuminate, pyrophosphate, citrate, and other mild preparations of iron are valuable. Hæmoglobin should be given when iron cannot be borne.

The case before us has pain, vomits, and probably has had hemorrhage, though small. He has lost flesh; is anæmic. The general suggestions for treatment just detailed may be thus modified in this case: The correction of his diet and the avoidance of all irritating drinks will probably relieve the pain and vomiting. But in addition to those

suggestions we will give the subnitrate of bismuth in ten-grain doses and nitrate of silver in one-fourth-grain doses four times a day. As a general tonic we will give the extract of malt, and if the case does not immediately improve we will add carbonate of iron and carbonate of potassium. He must confine himself to a milk diet, from six to eight ounces every three hours, and keep quiet. With these suggestions the assistant will watch the case, and report at some future day.

Three weeks later.—This patient has pursued the treatment marked out for him. You see the anæmic look is disappearing. There is no epigastric tenderness. The pain and vomiting have subsided, and he has gained ten pounds in weight.

Neurology.

TUMOR OF THE BRAIN.

CLINICAL LECTURE DELIVERED AT THE MIDDLESEX HOSPITAL, LONDON.

BY SIDNEY COUPLAND, M.D. (Lond.), F.R.C.P.,

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GENTLEMEN,—By one of those coincidences which not infrequently arise in hospital practice, we have had in the wards during the past month no fewer than three cases of cerebral tumor, an affection that, as a rule, we meet with here only at long intervals. Each of these cases presented features of an exceptional kind, as well as certain diagnostic difficulties, enhanced by the fact that in each the course run from the first appearance of symptoms to the fatal termination was comparatively brief. It has seemed to me that some profit would accrue to both you and myself if I took advantage of this opportunity to speak of this singularly interesting subject, and by a study of each of these cases deduce some points for future guidance. Nor must it be thought that the subject is only of importance from the side of diagnosis and the light thrown on the physiology of the brain. It involves the question of the treatment by surgical operation of brain tumors, a radical measure which, though limited in its scope, is determined by the accuracy of the diagnosis of the site and nature of the new growth. This is a very great advance upon the position not long since taken up in relation to tumors of the brain, and it is owing in part to the new spirit of surgery as described so forcibly by Mr. Pearce Gould in his oration at the Medical Society the other day, and also to the advancing knowledge of cerebral functions which physiologists and physicians have done so much to promote within the past two decades.

The first question that confronts the physician when investigating a case presenting symptoms of disorder of the brain is this: Are these symptoms produced by "functional" or by "organic" derangement? This is a question of infinite importance to the sufferer, to whom, indeed, it is a matter of life or death. Yet it is a question of great difficulty. Nor is this surprising; for the difference between "functional"

and "organic" nerve-disease is in all probability not a difference in the mechanism of nerve-function, for one can conceive of nerve-cells being over-stimulated or exhausted by themselves, apart from the grosser intervention of a hemorrhage, or a degeneration, or a new growth. Indeed, when we consider the delicacy and intricacy of the cerebral mechanism, it must rather be wondered at that it is not more often thrown out of gear, or that the slightest molecular change may not determine the most obvious and manifest symptoms. The "discharge" of the motor nerve-cells that is supposed to form the substratum of an epileptic fit may be initiated by changes that no microscope can detect, just as strikingly as by the obvious irritation of a tumor or a spicule of bone. So, too, with motor or sensory paralysis, which may conceivably arise from mere abeyance of function, just as extensively as from a destroying lesion, coarse and obvious to the eye. One of the cases that I am about to relate presented this difficulty at the outset, and it was some time before one felt that the case was really one of grave organic disease rather than a functional affection. I may allude, too, to another patient now in Hertford Ward, who was admitted with total loss of power in the left lower extremity, a crural monoplegia, without any wasting of the limb or evidence of organic disease, but with a rather curious mental hebetude. The paralysis persisted, and as a last resource he was treated with mercury pushed to salivation, and with iodide of potassium. The fact that under this treatment he has speedily regained power in the limb might be held to be conclusive of an organic origin for the paralysis, and that we had to do with a case of cerebral syphilis; but I would point out that there is still room for scepticism on this score, if only from the fact that a cerebral lesion adequate to produce this paralysis of a *whole* limb must have been extensive; and I am not aware that the softening from thrombosis or a syphilitic gumma involving so large an area of the brain cortex could possibly be so entirely recovered from under any specific treatment. It would have been different had we to deal with only one nerve, or indeed with isolated paralyses of more than one nerve; but then the lesions to be removed by treatment would have been slight and small, and the integrity of the nerve as a conducting medium would not have suffered. But here the whole limb was powerless, and, moreover, the rapid manner in which this powerlessness arose and has disappeared tell strongly in favor of a temporary abeyance of function.

Assuming that one has decided that the symptoms are not due to mere functional disturbance, but are really allied to some gross organic

lesion, we have next to determine what is the probable nature of the lesion, and what its situation. As between vascular changes, hemorrhage, thrombosis, or embolism, and the more chronic condition of new growth, the history of the case, and in particular the mode of evolution and progression of its symptoms, are material points for judgment, whilst the knowledge of the localization of function in the brain is the mainstay for the determination of the site of a lesion.

The clinical evidences of a tumor which involves the brain, whether it has arisen primarily from the bony wall of the skull, or from the meningeal coverings of the brain, or been implanted in the brain-substance itself, must of necessity be both numerous and varied. They vary according to the site of the growth, and to a certain extent according to its nature. A tumor at the base, for instance, may by compression of important nerves produce limited paralyses; one of the cortex may excite convulsions, followed by paralysis of more or less wide extent, according to the part of the motor area that it involves; or a tumor in the central ganglia in the white substance or the cerebellum or pons will be associated with signs in proportion to the degree of its involvement of the tracts of conduction of motor or sensory impulses or disturbances of special senses and other phenomena related to the normal function of the part affected. It is interesting to note that the earliest ideas concerning the regional distribution of areas of the gray cortex in accordance with the performance of particular movements of the body arose in the clinical observation of cases of partial epilepsy and paralysis controlled by post-mortem observation. The foundation of our knowledge of cerebral localization was thus laid in the careful study of the effects of disease, and it is a striking example of the indissoluble union between physiology and pathology that the clue thus given, amplified and extended in all directions by the labors of physiologists, is now our chief guide in the diagnosis of these diseases. To treat in detail of all the localizing symptoms which may be met with would take me far beyond the limits of a lecture such as this. They must be studied in text-books and monographs and in systematic lectures. I shall only be able to refer to such of them as illustrate the cases I am about to relate; but before entering on their description it will be convenient to refer to some of the symptoms of brain tumor which are common to the whole class,—symptoms and signs for which we invariably inquire, apart from the question of the seat or nature of the growth. The symptoms to which I refer include those of headache, vomiting, double optic neuritis, vertigo, convulsions, and mental defect. Of these not all are of general application; for instance, vertigo is mostly confined

to disease beneath the tentorium; convulsions, unless general, are mainly limited to lesions in or about the Rolandic area of the cortex.

The frequency with which the triad of symptoms—headache, vomiting, and optic neuritis—is met with in cases of brain tumor is such that they have been singled out as being most distinctive, not to say pathognomonic. They are not entitled to the latter distinction, however; for in the first place they are not all invariably present, and in the second place they do occur in the same conjunction in uræmia, lead-poisoning, and hysteria with anæmia. However, their coexistence is presumptive evidence of tumor or other “coarse” anatomical lesion, and when they occur the burden of proof that the condition is of another kind rests on those who maintain that it is so. *Headache* is of various kinds and degrees, and its causes are multifarious. Circulatory disturbances, as in heart-disease, blood states, as in anæmia, uræmia, and gastro-intestinal derangement, such as constipation, may provoke it. It may be purely superficial and neuralgic, or deeper seated and depending on what may be termed a nerve-storm, as in migraine, an affection which might be taken as the sensory counterpart of epilepsy. Just as epileptic convulsions are excited by gross organic changes, so, too, the sensory convulsion of paroxysmal headache is produced by organic brain-disease. One can understand the pain which accompanies meningitis or cerebral abscess, but the precise reason of the agonizing attacks of pain in cases of cerebral tumor is hard to seek. Roughly speaking, the seat of the headache corresponds with the site of the intracranial lesion. Thus, a cerebellar tumor more often produces occipital headache than it does frontal, and a growth on the convexity may give rise to pain referred to the vertex. It does not do, however, to rely upon this as a localizing sign. In many a case the pain is frontal, whilst the growth is imbedded in the brain-substance or at some far distant point on the surface. The intensity of the pain is not proportionate to the size of the tumor, nor, indeed, to its rate of growth; whilst its paroxysmal character is a feature that it shares in common with headache from other causes. In character it varies from a dull sensation, as of a heavy weight or compression, to an acute, shooting, well-nigh unbearable pain, closely analogous to that of pure neuralgia. It is possible that the paroxysmal character of the pain bears some such relation to the intervening period as the epileptic “discharge” does to the exhaustion which ensues after a fit. The sensory centre may have its cells exhausted by the intensity of their over-stimulation. We know so little, however, as to the nature and actual seat of pain that speculation is futile. It always seems to me that the

"mystery of pain" has a physiological as well as a philosophical aspect.

Vomiting usually accompanies the headache of brain tumor. It may be most marked when the latter is most severe. The type of vomiting is that which has received the somewhat equivocal name of "causeless," meaning, I presume, thereby an attack unassociated with any direct irritation of the gastro-intestinal tract or with any extra-cranial morbid condition. Vomiting of this character is not necessarily provoked by taking food, although it may be so. More often it occurs in the early morning, or after some change of posture, or, as stated, in association with an attack of headache. There may be no preceding sense of nausea, and although often infrequent, it may be so incessant as to render it difficult to administer food by the mouth. It occurs in all classes of cerebral tumors, and is no index of their seat or nature. It is, moreover, seldom absent at some time in the course of the disease. But similar vomiting may be excited by functional disturbance, the so-called hysterical vomiting, which has been known to become so uncontrollable as to endanger or even destroy life, and it is met with in obscure, probably toxic, affections of the nervous system, such as influenzal and diphtherial poisoning.

Optic neuritis is a valuable confirmatory sign of cerebral tumor. It is present in the majority of cases, and consists in a distention of the sheath of the optic nerve with inflammatory exudation, which may spread out on the retina around the disk, obscuring here and there the retinal vessels, of which the veins are swollen and tortuous. It may occur to a marked degree in both eyes without any disorder of vision. It is followed by atrophy of the disk, which, in the later stages of tumor, is as good a sign as the swollen disk is in the earlier. It may not be equally marked on the two sides, but more so on the side on which the tumor is seated than on the other. The cause of this optic neuritis has given rise to much debate, and it is still an undetermined question. A few years since Dr. Edmunds and Mr. Lawford showed that whenever it was present there could be traced some concomitant basal inflammation of the meninges, however slight. On the other hand, it has been thought to be related to the heightened intracranial pressure due to the presence of a growing tumor in the skull cavity, an hypothesis supported by the fact that after trephining the neuritis has been noted to subside. Yet the view of increased pressure, to which also the headache has been attributed, is hardly confirmed by the fact of the absence of neuritis in some cases. It is remarkable that in none of the three cases before us was it present in any marked

degree, but in one case (the second) there was slight evidence of commencing change in the disks.

Less common symptoms than the three just detailed, and yet likely to occur with tumors seated in any part of the brain, are convulsions, vertigo, general mental defect, and retardation of the pulse. Convulsions are naturally more frequent when the motor area of the cortex is directly implicated, but they do occur with growths seated in other parts, and are sometimes preceded by sensory auræ, when after death the growth has been found to implicate that region which is in relation with the special sense organ concerned in the aura. Giddiness is more often a symptom of disease of the cerebellum than of the cerebrum, but not invariably so, whilst mental derangement, amounting to marked insanity, may complicate any form of tumor.

It is time to turn to the cases we have recently had under observation, and as each of them illustrates further points in the clinical history of the subject, we shall, I hope, have traversed a fair portion of this wide field when we have completed their analysis.

The first case I may mention is one of great obscurity, but it possesses at least one curious feature, bearing on localization of brain function.

PETIT MAL; SUPRAORBITAL NEURALGIA; PAROSMIA; MENTAL DERANGEMENT; COMA. POST MORTEM, GLIOMA OF TEMPOROSPHEROIDAL LOBE.

CASE I.—Thomas R., aged forty-five, married, a carpet-plainer, admitted into Hertford Ward on May 3, 1895. He was said to have suffered from rheumatic fever (twice), typhoid fever (twelve years since), and from influenza in the spring and winter of 1894. It was after this last illness that, about six months before admission, he had been attacked with a "rush of blood to the head," followed by a momentary loss of consciousness and a "most offensive smell." No other sign of brain-trouble occurred until on April 10, when he was attacked with very severe supraorbital neuralgia, at first bilateral, and then confined to the right side. This pain became very persistent and unbearable; his manner altered, at times he was quite unmanageable. His speech was also affected. He had in his time been a free drinker, and there was a suspicion of his having contracted syphilis. There was no paralysis nor optic neuritis. He was a tall, stalwart man, with thick brown hair, and beard sprinkled with gray, and complained of an intense pain in the right supraorbital region, where there was distinct nerve-tenderness. He was irritable in manner, strange and wayward in speech. At times there was involuntary micturition, at other times



FIG. 1.—Right lateral surface of the brain of Case I., showing the position and extent of the glioma.

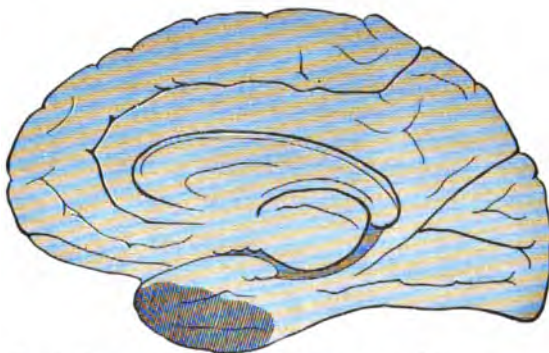


FIG. 2.—Inner surface of the right hemisphere of the same case.

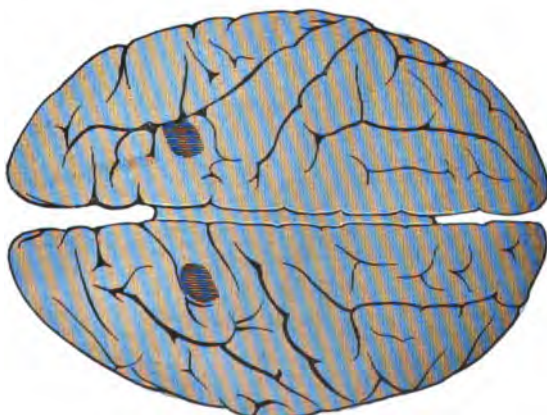


FIG. 3.—Site of the symmetrical secondary, sarcomatous deposits behind both ascending parietal convolutions of Case II.

the urine was passed quite naturally. Beyond some hyperæsthesia of the right side of the face there was no detectable defect, either motor or sensory. The reflexes were normal. Pulse was slow, 48, regular. Heart sounds natural. No signs of thoracic or abdominal disease, and urine normal. He had since the "fit" frequently complained of the "bad smell." The pain was so much relieved by treatment (iodide and bromide of potassium with occasional doses of antipyrin) and his mental condition had so far improved that on May 13 he was allowed to get up. But he was listless and preferred to lie down, taking very little notice of his surroundings. Moreover, he could not walk without staggering, but there was no ataxia. From this date he became more and more drowsy, and on May 21 he was only roused with difficulty. The temperature had risen to 101° , the pulse 50; pupils dilated, and plantar as well as patellar reflexes abolished. In the afternoon, after a brief epileptoid seizure, he became comatose and rapidly died.

The post-mortem examination by Dr. Voelcker revealed a gliomatous growth, involving the anterior and inferior part of the right temporo-sphenoidal lobe (see Fig. 1), which was here firmly adherent to the dura mater. The neighboring brain-tissue was in a state of yellow softening. There was no hemorrhage into the tumor, which could be traced to the surface of the crus, but two or three minute hemorrhages were seen in the pons and floor of the fourth ventricle. The lateral ventricles contained an excess of fluid. The right optic nerve was normal, and there was doubtful swelling of the disk. The lungs and bronchial glands contained some cretaceous nodules. Left ventricle hypertrophied.

Remarks.—You will have observed that in this case only one member of the triad of symptoms so distinctive of cerebral tumors was at all prominent,—namely, headache. That was markedly paroxysmal, and so intense that the man could not be controlled. It was, too, definitely localized in the right supraorbital region, although at first it was on both sides. He had some paroxysms after his admission, and he frequently complained of the pain, but there was no such violent attack as had been described as occurring previously. Indeed, in about ten days he was so free from pain and discomfort that he was allowed to get up. He was said to have vomited once only, and then Dr. Cross thought that it was gastric. Optic neuritis was absent. The most striking feature of the case was the mental state. Prior to admission he had been violently delirious and almost maniacal, and although he was never so excited whilst in the ward, yet his manner was strange, and his answers often incoherent and irrelevant, or else

he would take no notice at all and offer no response. On the day that he was allowed up he was strange in his manner, listless, and disinclined to move about. There were no paralytic symptoms, and no sign which could offer any guide to localizing a tumor if one existed, and on that one could not avoid having some doubt. However, Dr. Buzzard, whose experience is so large, thought that there was either a tumor or an abscess. Towards the close he gradually became drowsy, and took no notice of what was said to him. When admitted an ophthalmoscopic examination was made with difficulty, as he resisted it, but now he offered no opposition at all to the process. Yet I must confess I was not prepared for the *dénouement*. The predominance of mental derangement had led me to think that the case was one more fitted for an asylum than a hospital, and arrangements were being made for his removal when suddenly, after a slight fit, his stupor deepened into coma, and he died somewhat suddenly. Mr. Hargreaves noticed that the respirations ceased before the pulse.

The post-mortem revealed a gliomatous infiltration of the right temporo-sphenoidal lobe, which had become adherent to the dura, and the distention of the lateral ventricles with fluid explained the final coma. The locality of the growth is, you will observe, far removed from the seat of the headache, but it may be related to one symptom which the man had experienced, a sign to which one had perhaps paid but little attention at the time. You will remember that his first attack was one of slight epilepsy, "a sense of blood rushing to the head, followed by momentary loss of consciousness." There had been apparently no "aura," but following this "slight seizure" he complained of a *very offensive smell*. That was six months ago, but at intervals since he had at times complained of a repetition of this olfactory derangement. Dr. McLane Hamilton¹ has recorded the case of a female, forty years of age, who since the age of ten had suffered from slight epilepsy attributed to a fall. In the attacks she rarely bit her tongue, but usually frothed at the mouth. There was no history of one-sided spasms. The attacks were always preceded by an aura of a peculiar kind. She suddenly perceived a peculiarly disagreeable odor, sometimes of smoke, sometimes of a fetid character, and quite uncomplicated by any other sensory warning. She ultimately died from phthisis, her attacks occurring from time to time until her death. On examination the lower part of the right temporo-sphenoidal lobe was shrunken and indurated, the change involving the uncinate gyrus on the inner sur-

¹ Abstract in *Pepper's System of Medicine*, vol. v. p. 1679.

face of the lobe and the adjacent convolutions. The olfactory nerves were sound. Pathologically the condition was one of sclerosis from pachymeningitis. Now, experiment points to the uncinate gyrus being related to the sense of smell, and although the centre has not been very accurately defined, for the postero-parietal region also has apparently some relation to this sense, we seem to have here another link of evidence in support of the conclusion arrived at by physiologists. This is one of the most interesting features of the case, and the absence of any motor symptoms should have caused more attention to have been paid to this sensory defect as a localizing sign.

HEADACHE; VOMITING; DOUBLE OPTIC NEURITIS; TREMOR; PARESIS; PULMONARY CONSOLIDATION; COMA. POST MORTEM, SARCOMA OF MEDIASTINUM INVADING RIGHT LUNG; SECONDARY GROWTHS IN PARIETAL CONVOLUTIONS AND CEREBELLUM.

CASE II.—Sarah A., aged thirty-eight, married, a jam-factory hand, admitted into Murray Ward on March 14, 1895. She had been married sixteen years, and of five children only two are living; the first died at nine months, the fourth was still-born, and the fifth died at two years. Shortly before her fourth pregnancy she had been treated for sore throat and a skin eruption. In January she had "influenza," with cough and pains in the back and head. The headache persisted, became paroxysmal, and since March 1 had been associated with vomiting, mostly matutinal. She had also noticed some numbness of the right half of the face and a tremor of the left hand, especially during the attacks of headache. She was thin and worn, complaining of the paroxysmal frontal headache, which mainly occurred in the morning. Pupils unequal, the right dilated, but active; the left small and not reacting to light. The optic disks were blurred, especially the left, where the vessels were buried in exudation; in both eyes the retinal veins were engorged and tortuous. Pulse 64, regular; temperature subnormal. Some tremor of the hands when the arms were extended, especially of the left; no paralysis, motor or sensory. Superficial reflexes present; knee-jerks not to be elicited. Movements of chest fair and equal, but percussion note impaired over right base, where breath sounds were weak and some moist crepitation audible with inspiration. Tongue coated; marked constipation. Urine free from albumen or sugar. For a few days the pain in the right frontal region recurred with great regularity every morning, generally accompanied with vomiting and with marked jerky movements of the left arm. Then there would be a remission for a few days, followed by a return of these symptoms. She

was then taking iodide of potassium in increasing doses, but sometimes the pain was so agonizing that a morphia injection had to be given. On March 23 some paresis of both external recti muscles was noticed, but this, as well as slight right facial paresis which appeared on the 26th, proved to be transient. From April 2 to 5 the pain was most severe, and now involved the back of the neck. Meanwhile, a cough from which she had suffered all the time became more harassing, and an examination of the chest revealed signs of consolidation of the lower lobe of the right lung, over which there had been earlier definite friction sounds. During the first week in May there rather rapidly developed paralysis of the right hand and arm, with wasting, and she died suddenly on May 16.

The post-mortem examination by Dr. Voelcker revealed a large growth (round-celled sarcoma) in the posterior mediastinum, which had invaded the lower lobe of the right lung, and had also fungated into the cavity of the right auricle. The upper and middle lobes were the seat of pneumonic consolidation, but were free from any growth. The left lung was oedematous. There was a cherry-sized secondary nodule in the retroperitoneal tissue over the right kidney, but nowhere else in the abdomen. In the brain there was behind the ascending parietal gyrus on each hemisphere (see Fig. 3), and symmetrically placed, a small mass of similar new growth; also a nodule in the middle lobe of the cerebellum.

Remarks.—There was ample evidence in this case of the existence of cerebral tumor; the three classical signs, headache, vomiting, and optic neuritis, were all present; the two former very marked, the last only slightly developed. But it was not so easy to arrive at a conclusion as to the precise locality of the growth. That it was probably on the right side not far removed from the arm centre seemed indicated by the fact that tremor of the right hand was present, especially after an attack of headache. But she also had some numbness of the right side of the face, and in the course of her illness paresis of the right facial muscles, as well as of both external recti, signs which were transitory in duration, and the presence of which was hardly compatible with any single lesion. Add to which that the frontal headache came to be complicated with severe pain referred to the back of the neck, and before the termination of the disease paresis of the right limbs came to be added to that of the face and tongue. Thus, although at first the lesion seemed to be on the right hemisphere, later the signs pointed even more markedly to a lesion on the left side. Hence it is not surprising that the examination revealed multiple tumors, one on each

side, in the parietal region, not directly involving the motor centres, but so situated that some pressure and irritation may have been exercised upon these centres. Further, the existence of a third growth on the middle lobe of the cerebellum may possibly explain the nuchal pain.

Now, although clinically the most prominent symptoms in this case, and those which rendered the prognosis so bad, were connected with cerebral function, yet pathologically the brain lesions take a secondary place. During life there were signs of pleurisy and of impaired action of the right lung, but neither cough nor dyspnoea were prominent, except during the latter part of the case. The fact that cough, always slightly present, had been getting more troublesome was noted on April 29, and an examination of the chest showed that the right upper lobe was ill expanded, and that there was dulness over the base of the same lung. Still, we were not prepared for the amount of intrathoracic disease that was actually present. The primary seat of the tumor growth was found to be in the mediastinum, whence it had grown into the right auricle of the heart, almost filling it, and had also invaded the right lung, which was very extensively implicated. The tumor had spread into the lung along the bronchial ramifications, disorganizing the upper and middle lobes, as such growths do by, in the first place, narrowing the bronchial tube and then inducing collapse, followed by lobular inflammation and disintegration. With an obstructed bronchus it is clear that breath sounds and adventitious sounds from such a source would fail to be produced. Nevertheless it is remarkable and instructive, as also is the fact that there was no dysphagia, although the œsophagus was so completely flattened by the mediastinal tumor. A marked feature in the clinical record is the subnormal temperature that existed almost throughout the whole course of the case.

HEADACHE; VOMITING; PARTIAL LEFT HEMIPLEGIA; HEMI-ANÆSTHESIA; SUDDEN DEATH. POST MORTEM, GLIOMA OF RIGHT CRUS CEREBRI.

CASE III.—Ellen Mary S., aged sixteen, dressmaker, unmarried, admitted into Murray Ward on March 4, 1895. No family history of neurosis. She had had whooping-cough, measles, scarlet fever, and diphtheria in childhood; since then occasional headaches: never otorrhœa. On February 21, she suffered from a headache (frontal), followed by vomiting; but although able to work felt in "low spirits." On the 25th, the fingers of the left hand felt cold and she had pricking sensations in them. She was able to dress herself, but on going to work

became unable to use the left hand. Gradually the loss of power involved the whole of the left arm, this becoming complete about the 26th. Meanwhile, on the 25th, she found that the left leg "dragged" in walking and that she had no strength in the knee. At the same time she experienced a sensation of numbness over the left side of the face. She was an anæmic brunette, and exhibited evidence of slight facial paralysis on the left side overcome by effort. Pupils equal, slightly active, no strabismus, no apparent restriction of the visual fields; optic disks normal, vessels small, and fawn-colored spots of choroiditis in left lower periphery. Some lateral nystagmus on looking in an extreme direction up or down and in or out. Left arm quite powerless; can raise shoulder slightly, but has no power of flexing or extending arm, forearm, or fingers. No wasting. Can move left leg, but not so freely as right, and cannot move foot in any direction. Almost total left hemianæsthesia, face, arm, and trunk, but some sensation in leg. The left cornea is, however, sensitive. As to reflexes, the plantar is increased on the right side, abolished on the left. Marked exaggeration of knee-jerk on left side, where also knee- and ankle-clonus can be obtained. Triceps reflex also increased on this side. Pulse 78; heart normal. Constipation exists, but there is no other digestive derangement. The urine is normal. There was but very little change in these symptoms except that in addition there appeared some right-sided ptosis. Vomiting became moderately frequent, but there was no return of headache until the last day of her life. She died suddenly on April 2.

At the post-mortem examination, on removal of the brain a grayish-pink tumor was found in the right crus cerebri, which pushed forward and rather flattened the thalamus. The growth was lobulated; it did not involve the fourth and sixth nerves, but the third was flattened out. There were no hemorrhages. The fifth and seventh nerves were not involved, nor was the pons. Beyond some caseation and cretification of bronchial glands no other morbid changes were found in the body.

Remarks.—In many respects this case surpasses in interest either of the preceding, both clinically and pathologically. In the first place we were confronted with the root-question in the diagnosis of cerebral disease to which I previously alluded,—namely, whether the symptoms were the result of temporary functional derangement, or of grave and permanent organic disease. That the patient would be classed as of neurotic temperament must be admitted, but the existence of hysteria does not prevent the presence of an organic lesion. In the exhaustive

article contributed by Drs. C. K. Mills and J. H. Lloyd to Pepper's "System of Medicine," the writers say (vol. v. p. 1055), in speaking of this very subject, "Strange to say, one of the most frequent mistakes in diagnosis is that which arises from confounding brain tumors with grave hysteria. . . . One of Hughes Bennett's cases, a wayward hysterical girl of neurotic family, had had her case diagnosed as hysteria by one of the highest medical authorities of Europe, and yet after death a tumor the size of a hen's egg was found in the cerebrum." It was therefore pardonable if at first we were inclined to attribute the paralysis and anæsthesia to a functional cause, especially as there was an absence of optic neuritis, and to a great extent also of headache and vomiting, the cardinal signs of gross cerebral disease. But as time went on and there was not only no improvement in the paralysis, but additional evidence of it, and as both headache and vomiting became slightly more prominent, the existence of a cerebral tumor became more certain. The locality of the new growth accounts for the clinical phenomena, for involving the crus it must have interfered with the path of conduction of both motor and sensory impulses on the opposite side of the face and body. The interesting point is that the left leg was only slightly paretic, and that the deep reflexes on that side were so markedly exaggerated. It would appear as if the tumor had completely interrupted the sensory path, but had only partially destroyed the motor tract. The motor (pyramidal) tract in the crus occupies the middle third of the tegmentum, the paths for the impulses to the muscles of the arm being in the centre, and those for the face and leg at the sides. There has not yet been time for a microscopical examination of the affected region, but one might anticipate that the growth was deeply seated in the crus, coming to the surface in the course of the arm fibres, and perhaps only compressing those of the face and leg. The late occurrence of right-sided ptosis shows that the third nerve was commencing to be implicated at its superficial origin, but it is somewhat remarkable that although the optic tract was displaced by the tumor there was no limitation of the field of vision, and in particular no hemianopsia.

I find that the time at my disposal has already expired, otherwise I should have liked to have amplified the account of these interesting cases by some remarks upon the grounds for making a diagnosis of the nature of a cerebral new growth. This is mostly a matter of conjecture, unless in the history and in the concomitant signs there is sufficient evidence to suspect a syphilitic or a tubercular formation. Nor did any of these cases afford ground for surgical intervention. It is pos-

sible that trephining alone might have relieved the headache, but the removal of the growths was obviously out of the question, even if their precise seat had been accurately determined during life. Cerebral surgery has its greatest scope in this regard only where the tumor is situated in the Rolandic region, where its localization is more certain, and also when the tumor is eucapsulated rather than when it infiltrates surrounding tissues.

FACIAL PARALYSIS IN THE INFANT.

CLINICAL LECTURE DELIVERED AT THE TOULOUSE CLINIC FOR DISEASES OF CHILDREN.

BY DR. BÉZY,

Professor (Agréé) in the Toulouse Faculty of Medicine, and Clinical Professor of Diseases of Children, Toulouse, France.

GENTLEMEN,—A study of your text-books would lead you to suppose that the great majority of writers on the subject of facial paralysis in the newly born believe it to be the result of traumatism, affecting the seventh pair of nerves directly; but this is not the only condition which brings about facial paralysis. In this lecture, therefore, it is proposed to give you the most important details of a number of cases which illustrate obscure phases of this disease. We also wish to show you that facial paralysis occurring in the infant without any traumatism, such as the application of the forceps in delivery, is not as rare as one would be led to suppose from reading alone.

The most common cause of facial paralysis in infancy is, of course, the prolonged use of the forceps, and we may, for the time being, set this class of cases aside, and refer those who are interested in this subject to the writings of Henoch.¹

Next in order would come those obscure cases of facial paralysis which occur as a result of some lesion of the medulla oblongata, which have been variously accounted for by different writers.² Simon³ calls attention to a form of facial paralysis of cerebral origin, occurring coincidentally with a paralysis of the lower extremities. Bernhart⁴ relates a case of congenital paralysis of the trifacial or fifth nerve that was one-sided. Neumann has published a series of rheumatic

¹ Henoch, *Leçons cliniques sur les Maladies des Enfants* (traduction Hendrix), 1885, p. 182.

² Schultze, *Neurologischer Centralblatt*, 1892, No. 14, p. 426.

³ J. Simon, *Leçons cliniques*, t. ii. p. 148.

⁴ Bernhardt, *Archives de Neurologie*, t. xxiii. p. 99.

cases, the primary cause of which was apparently an attack of coryza; and Charcot,¹ accepting the suggestion of Neumann, has classed these cases with those of the rheumatic neuroses. In all such cases some hereditary tendency to nervous disease has been found without difficulty. Comby,² Henoeh,³ and myself⁴ have reported similar cases. It is questionable whether we should include in this class certain cases of facial paralysis sometimes found to accompany chorea. Charcot⁵ and other writers⁶ have furnished examples of the coincidence of facial paralysis with chorea.

Certain lesions of the medulla oblongata can bring about facial paralysis, and yet be unaccompanied with symptoms which would place them in the above class. The symptoms will vary necessarily with each case. When the lesion is associated with an affection of the eighth or auditory nerve, this association will be made apparent by some discharge from the external meatus and concomitant enlargement of the cervical glands that will at once call attention to the presence of suppuration.

Where the lesion has a peripheral origin the aspect of the face is similar to that which we find in an adult afflicted with facial paralysis, giving the well-known picture of the staring eye on the affected side and the inability to respond to emotions, such as laughter and crying, on the affected side. By telling the patient to close both eyes, the lesion at once becomes apparent. But in infants, this aspect of the face, which is so characteristic in an adult, may not be present, or may be so little marked that it will be passed over by those who are not accustomed to observe carefully the symptoms of children's diseases, and who are unfamiliar with the methods of examination. The paralysis of the facial nerve will, however, become apparent at once when the child cries, as the face then takes on a grotesque appearance. If, however, the infant is the first one in the family, and falls under

¹ Charcot, *Leçons du mardi*, 1887-1888, pp. 119, 359.

² Comby, *Traité des Maladies de l'Enfance*, p. 270.

³ Henoeh, *loc. cit.*

⁴ Bézy, *Midi médical*, 14 mai, 1892, l'histoire de deux frères atteints de la même affection.

⁵ Charcot, *Méd. mod.*, 12 août, 1898.

⁶ Brissaud et Marie, *Bullet. méd.*, 1893, p. 1081. Londe, *Rev. de Médecine*, décembre, 1898, et mars, 1894. Filatoff, *Un Cas de Paralysie bulbaire chez un Enfant de onze Ans*, *Bullet. méd.*, 1^{er} avril, 1894, p. 809. Hoppe-Seyler, *Affections de la Moelle allongée chez les Enfants*, *Deutsche Zeitschrift für Nervenheilkunde*, 1892. Thomas Olivier, *Paralysies centrales de la Naissance*, *Brit. Med. Journal*, April 8, 1893.

the care of an inexperienced nurse, the disease may remain present for a long time without being recognized; or, if paralysis is bilateral, it will be entirely overlooked.

To forcibly bring about some display of emotion would be the only way, therefore, to demonstrate the presence of paralysis. In dealing with an adult the matter of diagnosis would be much simpler, as it would then only be necessary to tell the patient either to shut his eyes, open his mouth, or make some decided effort with the facial muscles, and note the result. Ordinarily the diagnosis of the affection is readily made, and its cause is determined without much difficulty, as a rule; but there are cases in which errors of diagnosis are liable to creep in. This is especially apparent in the fifth one of the cases (see Figs. 3 and 4), about to be detailed, in which it will be seen that an infant, after suffering from chicken-pox, had a well-marked deviation of the mouth to the left side, accompanied with paralysis of the muscles of the back of the head and neck and convergent strabismus. With these symptoms it was thought that some cerebral lesion had developed, but a careful examination of the muscles of the eye showed that there was a complete paralysis of the external rectus, which is, as you know, supplied by the oculo-motor nerve. Ophthalmoscopic examinations should therefore be made in all such cases, as it may throw some light on the diagnosis. In a case of facial paralysis, associated with a suppurating middle ear, meningeal complications must be guarded against. In some obscure cases, where lesions of the medulla oblongata have been demonstrated post mortem, the symptoms during life simulated facial paralysis, especially that form which affects the muscles of expression around the mouth; or again, it is possible to have a hemiplegia of cerebral origin, associated with prolonged use of the forceps, and resulting facial paralysis.

The prognosis is a favorable one in the obstetrical forms of facial paralysis, and in the major number of those due to a nerve lesion, except where a suppurating middle ear is present and may give rise to cerebral complications.

The treatment should be formulated in accordance with the cause of the condition and directed towards its removal, if possible. Where there is some suppuration of the ear, the strictest antiseptic precautions should be taken, and the mastoid process trephined if there is the slightest indication of the collection of pus in that neighborhood. Electricity with the faradic current will frequently be of service, and the tincture of *nux vomica* may be given internally.

HISTORY OF THE CASES.

CASE I.—Adelaide S., thirteen months old, with a neurotic family history, was born without any special difficulty at full term, and was given into the charge of a nurse. This woman noticed, when the child was a year old, that whenever it cried it turned its mouth to one side, and at the end of a month brought it to our clinic. It was at once apparent that when the child cried the left side of the face was immovable, and that the left eye could not be closed as could the right. The movements of the globe of the eye were apparently normal. The child was treated with electricity, and recovered in less than a week. It returned to the clinic several months later, and was apparently in good health. It has remained healthy ever since.

CASE II.—Alexander P., seven years of age, had well-marked choreic movements of the right side associated with a left-sided hemiplegia and facial paralysis of the right side of the face. The family history was negative, and although everything was done to improve his condition, after several weeks of treatment the child died and no post-mortem was allowed.

CASE III.—George C., twenty-two months old, had been brought up on breast-milk until the eighth month, and after that on improper food, which soon caused dyspepsia, associated with considerable tympanites. At the age of eight months and a half he had measles and broncho-pneumonia, which has left behind it a cough from which he is still suffering. Following the attack of measles he had impetigo, conjunctivitis and otorrhœa; and then the nurse noticed that he turned his mouth to one side when he cried, and brought him to our clinic. We found enlarged lymphatic glands all over the body and a marked condition of marasmus. The child was vomiting constantly; his pulse was thready and irregular, and convulsions occurred frequently. He died a few weeks later, and at the autopsy unmistakable lesions of general tuberculosis were demonstrated. It is probable that in this case the facial paralysis was due to an affection of the facial nerve, as a result of extension of the inflammation of the middle-ear disease along its sheath.

CASE IV.—Peter D., fifteen months old; father probably tubercular; mother healthy. Child presents a large retromaxillary adenitis associated with middle-ear disease and facial paralysis of the same side,—that is, the left. The lesion in this case is undoubtedly due to an extension of the otorrhœa to the facial nerve.

CASE V.—Joseph C., three and one-half years old, brought to this

hospital in April. The family history was negative, except that one of the patient's sisters has rickets. He was breast-fed, and has had some meningeal trouble at the fourteenth month, when he was cutting his teeth. He had varicella at the age of two months. On examining him we found that his head fell forward, and he could only speak with the greatest difficulty, because the right side of his face was so much drawn down. He could close his eyes, but he had well-marked converging strabismus. He had, in fact, paralysis of the lower part of the facial nerve associated with paralysis of the internal recti and the muscles of the back and the neck. This case was completely cured, in about a fortnight, by the systematic application of the faradic current and the internal administration of *nux vomica*.

TRAUMATIC FUNCTIONAL PARALYSIS.

CLINICAL LECTURE DELIVERED AT THE NATIONAL HOSPITAL, LONDON.

BY C. E. BEEVOR, M.D., F.R.C.P.,

Visiting Physician to the National Hospital, London.

GENTLEMEN,—I propose this afternoon to show you two cases of traumatic functional paralysis, or, as it has been called, traumatic hysteria. The first case is that of a man aged twenty-five, who in April of last year fell twenty feet, striking his back in the lumbar region. He was working at the time in the Blackwall Tunnel, excavating there,—perhaps, as some of you know, under very great pressure; in fact, the pressure under which he was working he himself estimates to have been about two and a half extra atmospheres, or more exactly twenty-four extra pounds to the square inch. The family history of this man throws no particular light on the disease; there is nothing neurotic about his family, and he himself has always enjoyed good health, having always been a steady man. There is no history of specific infection as far as we can ascertain. While he was working he fell twenty feet from the ladder upon which he was standing, falling on his back, and striking just over the lumbar region. He did not lose consciousness at all, and he was disabled at once,—at least so he thinks. He claims that he was unable to move the legs at all directly after the fall, and on cross-questioning him, this appears to have actually been the case. There was no loss of sensation. On account of this paralysis he went to the Dreadnought Hospital, where he remained eighteen days. He did not improve very much, but was able to get about on crutches when he left there, but he says he could not move the legs any better. Then he went home, and began to have sharp shooting pains in the back, in the neighborhood of the right and left mid-lumbar regions. There was no trouble with the sphincters, except that he had a little difficulty occasionally in starting to make water, but there has never been any incontinence. Then he has had pain in the back of the head in the occipital region, especially when he began to use crutches.

He came to my out-patient department about June 24, and his condition at that time was as follows: There was nothing wrong about the face, there was nothing wrong about the arms, except that the grasp was rather weaker than it should be for a man of his age. The legs were also completely paralyzed; that is to say, he could only just move all the joints; but the movement was very slight indeed, and showed very great weakness. He could extend the knees, moving the foot about an inch, or something like that, but not more than that. When he first came the knee-jerks were slightly increased on both sides, but they were equal. There was no ankle-clonus, and as I said before, there was no affection of the sphincters. There was no anæsthesia, but there was intense hyperæsthesia, and over a particular part. I want to show you this patch of hyperæsthesia, and I have a diagram of it here which will give you a very good idea of where it was. You will notice that it takes a particular form, and begins above at the twelfth dorsal vertebra, and then it goes down to the coccyx, and then on either side it spreads down and forward over the iliac crests, and then it runs upward over the pubes, extending down the upper one-third of the legs front and back. As the house physician has described it, it is of the shape of a pair of bathing-drawers, and this shape is a very important point. It begins exactly at the twelfth dorsal, and the best way of testing it is to take a sharp-pointed instrument and scrape down, and the patient will tell you when it begins to hurt. This area of impaired sensibility is lower down than it was when he first came in. When he first came under observation the hyperæsthesia was very intense,—even a bit of wool dusted on gave him great pain, and he could hardly stand it at all, but that has got very much better. The pain in the legs is very much diminished.

With regard to his motor power, at present he is capable of making all the normal movements, but they are still weaker than natural and are only performed with a certain amount of effort, but when he came in he was quite unable to move the legs to anything like this extent. He could not walk when he first came in, but at the present time he is able to walk with assistance. (Patient walks.) I want you to notice the character of his walk. You see he does not drag the foot at all,—he is able to clear the ground all right, but he is very tremulous and shakes all over, and especially in each foot as he puts it down and it takes the weight of his body. Remember this. Then with regard to the deep reflexes, you see he has got a very active knee-jerk, and the least touch sends the foot up. I think they are both equal, and both increased. Ankle-clonus is not

obtainable. It is debatable as to whether there ever was ankle-clonus in this case or not. I have never observed true ankle-clonus in this case, and he certainly has not had continuous ankle-clonus. With regard to the question of anæsthesia, you see that he knows where I am touching him, and the superficial reflexes, the plantar, and the epigastric reflexes, are present. Now, I may just say one or two words about the diagnosis of this case before going on to the other case,—that of a boy. The first thing is that the man, so far as we know, fell on his back and severely struck it,—he struck it on a sort of iron beam. Then directly after he got loss of power in the legs, without any loss of sensation and with no affection of the sphincters. Now, the question is, what may his condition be due to? The sudden onset following a blow may be due to a fracture or dislocation of the vertebræ, or it may be due to hemorrhage into the cord. Those are the chief things one has to think about. Well, in the case of vertebral fracture or dislocation you have in most cases a prominence in the back,—not in every case, but in a large number of cases there is a prominence in the spine over the lumbar or dorsal region, or wherever it may be that the fracture takes place. Then after the general paralysis below the seat of fracture you get wasting of the muscles, and anæsthesia very often, in the areas which are supplied by the spinal root which is affected by the dislocation or the fracture, and you also get intense pain shooting along the particular nerves pressed upon.

In cases of hemorrhage you get sudden paralysis of motion, and very often paralysis of the sphincters, and often in a few days' time you get acute myelitis. In other cases in which the onset is not sudden, you have to distinguish them from pachymeningitis, or what is known as chronic internal pachymeningitis, described by Charcot and Goffroy. That also comes on after injuries, but, as a rule, it comes on more gradually than it did in this case, and first you have pain in the back, which is worse on movement, you have great irritation at the nerve-roots, sharp shooting pains which extend along the nerve-trunks, and then you have spasms of the muscles and very often hyperæsthesia. These are the first symptoms. Later there is paralysis of the nerve-trunks, both motor and sensory, and at the same time paraplegia of the parts below through pressure. There are one or two points about this case which differ from all those, that is, a peculiar hyperæsthesia, to which I will come presently. Then I might mention another point before I go on to the boy's case, and that is the question of reflexes in this man. Never, so far as we have seen since we first saw him in June, has there been any ankle-clonus. There has been

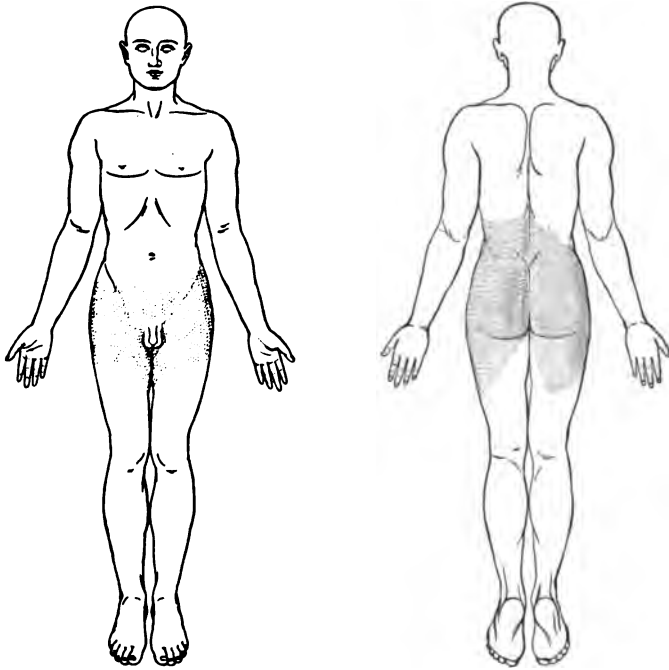


FIG. 1.—Area of hyperaesthesia in a case of traumatic paralysis.

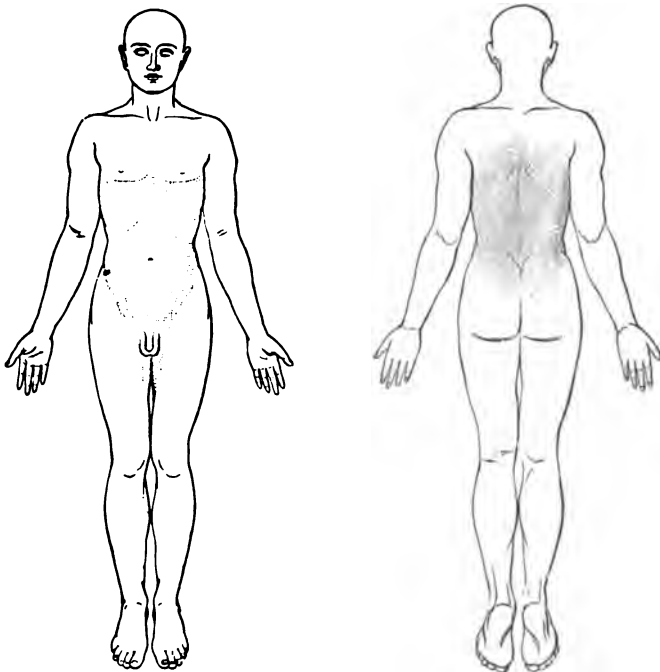


FIG. 2.—Area of hyperaesthesia in a second case of traumatic paralysis.

an increase in the knee-jerk, but never any ankle-clonus, and that in itself is rather an important point, because in this case he fell on his back; and of the area of the hyperæsthesia point, the highest was at the twelfth dorsal vertebra, and so one has to think what would be the symptoms supposing he had a fracture or dislocation at that level. The hyperæsthesia, as a rule, corresponds to the level at which a fracture takes place, because it is due to the compression of the nerves which come out from the intervertebral foramina. So in this case, taking the hyperæsthesia as the starting-point, there ought to be a lesion about the twelfth dorsal vertebra. Well, in that case you would expect to have paralysis of the lower parts of the legs. You would have difficulty in extending the ankle, and probably some difficulty in flexing and extending the knee. You would have besides that an affection of the sphincters, and also would have some anæsthesia. Now, the character of the hyperæsthesia is also a very important point—that is to say, the area and extent of it—in determining as to whether it is due to disease of the spinal cord or not. You notice that his hyperæsthesia (he has no anæsthesia) is in the form, as I have said, of a pair of bathing-drawers, and it presents different characteristics from what you get in the case of spinal disease. I cannot show you the areas of hyperæsthesia, but I can show you the area of anæsthesia, in the case of fracture or dislocation of the twelfth dorsal vertebra. It was a case that came into the out-patient department about a year ago, and afterwards came into the hospital under Dr. Bastian, and was operated upon by Mr. Ballance, and this diagram here will show you the anæsthesia there was in that case. The anæsthesia in that case was in strips, and that is the distribution of the anæsthesia arising from organic disease. It occupied almost the whole of the front of the legs below the knee, the back of the legs, a strip up the middle of the thighs behind, and part of the buttocks. So in this case shown to-day the hyperæsthesia does not correspond with what you would expect to get in a case of actual fracture or dislocation. Another point is, that the hyperæsthesia does not go right round the trunk keeping at the same level. As I showed you here in this diagram, the hyperæsthesia begins at the twelfth dorsal vertebra and slopes forward and downward. Now, in a case of organic disease of a lesion about the twelfth dorsal you would expect the hyperæsthesia to extend right round the trunk in the form of a belt; it does not go down towards the pelvis. In that respect also this case differs from one of fracture of the spine.

I now propose to show you this boy, sent to me by Mr. Collins, of

Wanstead, as a corollary to the other case, and in some respects like it, while in others different. This is the case of a boy aged fifteen who was at school, and in February last he was standing on another boy's shoulders, when he fell down and struck the left buttock on the stone floor. He was unconscious for a short time,—he doesn't know how long,—and after that it appears that he got up; he didn't think much of it, and went to school two days afterwards. But he never lost the pain, and he always seems to have had it ever since, and that pain continued until some time in May, when he found that he had difficulty in walking, as it hurt him so. His legs gradually got weaker and weaker, and at last he could not walk at all, and had to take to his bed. He has had pain in the left side of the body several times to such an extent that he could not move until it was over. He used to have this nearly every day, and now he has it about twice a week. In this case there is no family history of insanity or nervous disease, he has been always healthy, and, as far as one knows, there was nothing neurotic either about the boy or his family. Then he came to the hospital as an out-patient in July last, and was admitted in September. It was at once noticed in this boy, as in the other case, that there was no displacement of the spine, and that he had very little power to move his legs at all. There was no anæsthesia, the knee-jerks were active, and there was an absence of the superficial plantar reflex, but the cremasteric was present, and the abdominal and epigastric reflexes were also present; there was no ankle-clonus and no anæsthesia, and the sphincters were not affected. When he came into the hospital in September it was noted that he had extreme tenderness, extending from the third dorsal spine down to the coccyx, which was intensified over the sacrum, and there was also a line of tenderness extending along the front of the abdomen,—passing round the front of the chest to the ensiform cartilage, and down to the pubes, and also down the inner side of the thighs. That was the area of his hyperæsthesia. Now, with regard to his movements, he could with great difficulty raise the feet about one foot from the bed when lying down, but very slowly, and he could also dorso-flex either foot very slowly. There was great difficulty in sitting up in bed. These are the main points. There was nothing wrong with the arms at all, no anæsthesia, and there was nothing wrong with the fields of vision; they were not contracted, and there was no difficulty in his distinguishing colors. I want you now to notice the character of the movements,—you will see how very slow they are. You see that he can bend up the foot to the full extent, but it is with a hesitating movement, going in jerks and stages, and this

is very characteristic in cases of functional paralysis. The knee-jerks are active and equal. There are one or two "jumps," but I have never observed any true ankle-clonus,—just a tendency that way, but not enough to describe it as such. You see (tickling the feet) there is practically no plantar reflex whatever. (Dr. Beevor then touched the legs in various parts, and asked the boy whether he could tell where he was being touched. There appeared to be a little uncertainty on his part in locating the sensation in the neighborhood of the right knee.) We have never been able to discover any anæsthesia,—he hesitated just now, but I don't think there was any ground for it. You see his hyperæsthesia extends from the third dorsal vertebra down to the sacrum. The abdominal reflex is very well marked, also the epigastric. The abdominal reflex is shown by the drawing of the umbilicus to one side, and the epigastric reflex is denoted by a lateral movement of the epigastrium. The grasp of the hands is fairly good.

This case rather differs from the other one because whereas in that case the onset came on at once, in this case it did not come on until about three months afterwards. That is a very long interval, but all that time the boy has never been free from the pain over the left buttock. Whether he has had the hyperæsthesia all that time one cannot say, because no attention was called to him until about May, when he appeared to have difficulty in walking. Well, in this case, of course, fracture and dislocation are rather out of the question, and so also is the possibility of hemorrhage in the cord, owing to the onset not being sudden. Therefore one is left really with myelitis, meningitis, or Pott's disease to choose between. In a case of acute myelitis the onset is more or less gradual, commencing usually with a certain amount of pyrexia. Generally there is a certain amount of pain—not very much—and some hyperæsthesia, but nothing like so much as in this case. That is followed by paralysis of the legs, which is very often complete. We may also have some wasting of the muscles, and you may have some loss of electrical reaction, and the muscles which are so affected are those whose nerves come from the part of the cord which is the seat of the myelitis. Then there is some anæsthesia, and the knee-jerk is either lost (if the lumbar enlargement is affected) or it is increased. The sphincter vesicæ, as a rule, is paralyzed, or very much affected; that is to say, if the lesion is in the lumbar enlargement you have an incontinent dribbling away,—as fast as the urine goes into the bladder it escapes,—whereas if the lesion is in the mid-dorsal the bladder becomes full, and is then discharged reflexly, without the will having any power to prevent it. Then you have the girdle-pain at

the level of the lesion. So you see that such a case is quite different to this in almost every point. Then in the case of Pott's disease you have caries and projection of the spine. In this case, you see, there is no projection of any of the spinous processes, and there is no girdle-pain; there is a vast amount of hyperæsthesia, but it is too extensive,—there is too much of it. You see this boy has hyperæsthesia right up to the third dorsal, therefore you would expect the lesion would be about there. Or suppose it were there, then you will have the girdle-pain, corresponding to the third dorsal, but you would never have it extending all down the body, which would show that the lesion extended the whole length of the cord. Therefore he has got too much hyperæsthesia to justify that supposition. Then in a case of Pott's disease you have other symptoms, you have the knee-jerk increased, later on you get very marked stiffness of the muscles, you get an affection of the bladder, and you get a certain amount of anæsthesia, although the latter may often be absent. In chronic meningitis the hyperæsthesia is more extensive, but it is also attended by sharp shooting pains, anæsthesia, and wasting of the muscles corresponding to the spinal roots, which are at first irritated and then paralyzed. So in this case one really makes one's diagnosis from the fact that after the injury—in one case directly afterwards, and in the other case some months afterwards—there are certain symptoms which are not compatible with what one knows of organic disease, and so one makes a diagnosis very largely by the process of exclusion, as well as by carefully comparing the general character of the symptoms.

That condition or affection of the ankle which I showed just now is very characteristic of functional disease, and which one does not find in organic disease. These patients either cannot lift up their foot or else they can, and, as a rule, their first attempt will be better than their second, because they get tired, whereas in a functional case the more encouragement they have the better they do. You notice that that little boy got it up so far and then a little farther, and with a little encouragement brought it up to the full extent.

There is another point which I meant to show you in that boy which I did not do. He does not show it quite so well as he did, but it was very well marked in a case I lectured on about a year ago. This man was unable to extend the knee. That is to say, if he sat down on a chair, and you asked him to put his leg out, he was unable to do so. On the other hand, if you extended his knee for him and asked him to keep the leg straight, and you yourself tried to bend it, you could not overcome the force of his muscles.

Well, it is obvious that if a man has sufficient power to keep the knee out stiff and to prevent you from flexing it, and yet with all that strength he is unable to extend the knee (the leg hanging down) when he is asked to do so, it is not consistent, and there is something wrong somewhere; and if you get a man like that, the presumption is very strongly in favor of the disorder being of a functional character. This man got on perfectly well and was able to walk without any difficulty, and that point enabled us in the absence of all symptoms of an organic disease to make out a diagnosis of a functional disorder.

I should just like to say a few words about the nature and treatment of these cases. Now, these cases of traumatic functional paralysis (I think that is the best way to describe them) occur, as a rule, after an accident, but not immediately afterwards. In the case of a railway accident, for instance, a person is able to walk home, or to help others who are injured, and perhaps on the next day the symptoms develop, and he takes to his bed. The occurrence of that interval is often taken advantage of by the counsel on the opposite side in actions at law, who contend that as the man was able to walk home after the accident, he could not have been seriously injured. But that is exactly what does happen in these cases. Then, with regard to the sex, the male sex are affected, under traumatic conditions, almost as much as the female. There is no limit as to the age. You see here is quite a young boy, only fifteen, and here is a man of twenty-five, a strong active man, who is the last person one would think to have anything like this.

Well, the main points, then, are these: absence of complete paralysis, absence of wasting, the character of the movements, the character of the walking, the general unsteadiness and want of confidence, and great tremor in movement. Then we have hyperæsthesia with a too excessive distribution for an organic disease, and the upper level corresponding to the tenderness of the spines, and then—in the man—extending downward, and not in a ring round the body. The sphincters were not affected, the knee-jerks were active, and there was no true ankle-clonus.

Now, the prognosis in these cases is good for eventual cure; that is to say, the majority of these cases do get quite well, but they often take a long time and one must have a lot of patience with them. The only thing to remember about the prognosis is, that if a man has once had a disease like this he is very likely to have a recurrence of it on very slight provocation. One man was treated in this hospital, got perfectly well, and then went out again,—went home to his old sur-

roundings and got as bad as ever. He came back into the hospital, and was finally discharged again improved. So there is always that fear that although a man may get well, he is more liable to a breakdown than other people.

With regard to the treatment, of course the first thing to do before commencing treatment is to make one's diagnosis and exclude organic disease. Remember that it is only by going thoroughly over the case and thinking of everything that is possible, and excluding all those that are not, that one is able to make a diagnosis, and to say that it is really functional and not organic. Well, the first thing in these cases is to gain their confidence. It is no use to laugh at a man, or to try to bluster him out of that condition. The wiser plan is to enter into his troubles, and to look upon them as being real, as, of course, they are. I am quite certain that in these cases they cannot help it at all. It is quite different from malingering, and one does more good by paying attention to their troubles than by laughing at them. Another point is to give them rest in bed for a certain time, and especially in private cases, where the Weir Mitchell treatment is about the best you can adopt. This treatment was introduced by Dr. Weir Mitchell, in America, some years ago, for the treatment of cases of extreme wasting in hysterical women who would not take their food. This treatment is very useful even when applied to cases which are not wasting and who take their food fairly well, especially if there is much mental worry and anxiety, patients complaining of severe pain in the head, and being unable to concentrate their thoughts at all. Those are people to whom the Mitchell treatment does a great deal of good. I believe exclusion, shutting them off from all their friends and the world, does them the most good. They get into a new groove altogether, and that seems to be more beneficial to them than anything else. Besides that, they must be well fed, and to enable them to take a large amount of food they must have massage and faradization of the muscles every day. In private cases the first week is always the worst, and if you can get over that week satisfactorily you can manage a patient, and it is all right, but it is sometimes very difficult. In one of my cases the patient said he was "going home" every day, but he did not.

Supposing that after they have had the Mitchell treatment they have not got well, another form of treatment is that of faradization with a wire brush. There is a particular way in which one can apply it, and it is very useful in cases of paralysis. You do not apply it directly to the muscles, but you have one pole on the skin anywhere

in the back or leg, and with the other you apply the wire brush and place it underneath the calf; you then get the patient to make an effort, and at the same time you turn the current on. It acts as a very powerful stimulant in these cases, and the leg is often lifted up in the air at once, whereas, perhaps, previously the patient was quite unable to move it at all. You see in that way you do not really throw into action the muscles which help to lift up the leg, and therefore there is no fear of the action being due to actual faradization of the muscles themselves; the whole thing is done by the patients, and this gives a great stimulus to them. Every time the leg goes on the brush they receive a shock, and it is a great inducement to them to keep it up. So it is with the foot: if you touch the sole with the wire brush while the leg is fixed, the foot goes up at once and the patient keeps it up, and in that way you give power and strength to the patient to do it himself. Then after that, as soon as you have got the patient to move the leg,—of course, I am speaking now of extreme cases,—the next thing is to get him on his feet. This man has only just begun to walk, and he gets on fairly well. They either walk with a go-cart or else hold on to the nurses' arms on either side.

One important point in these cases is that you should hold their arms, and not they hold yours. If you take hold of the patient's arm firmly in this manner (seizing patient's arm), then you can give the man as much support as you like, and gradually take off your hold, until the man practically has no support at all. If you relax your hand, you can manage so that in time the man is practically walking by himself without knowing it. Well, as soon as he is walking by himself without knowing it, then the next thing is to get him to walk by himself and to let him know that he is doing so; and by going like that, from step to step, much more good is done in these cases than by any abrupt measures. You very often fail utterly if you try to do it all of a sudden. In other cases you can give the patient your little finger to hold, and the slight support afforded in this way will enable him to walk. The inability to walk really proceeds from want of confidence, which it must be your effort to restore.

I want to say a few words about what the condition really is, but I must be as brief as possible. The question is, Is this condition really hysteria, or is it something else? My own opinion coincides entirely with that which Charcot held,—that it is really hysteria, and that it does not differ from other forms of hysteria, but that it is produced by a man undergoing some severe shock or some

severe blow, which is accompanied in most cases by a violent physical shaking, and also by very strong emotion. So that the symptoms are partly physical and partly psychical. A person—even a strong, healthy man—is reduced by these accidents to the condition of mind of a woman with hysteria.

In Germany it has been considered by some writers that traumatic neurosis, as it is called, is really a separate disease, and that seems to me to be a mistake, because if you take a case of functional paralysis after an accident, and take functional paralysis in a woman or young girl not arising from any accident, you really cannot tell one from the other. Therefore I cannot see why you should describe a fresh disease, or coin a new name for a disease because it happens to occur under varying circumstances. Both conditions are due to the same cause, that is, to some strong emotional condition, only one is produced by perhaps a love-affair and the other by a severe accident. It is, of course, a question as to why some people get these symptoms after an accident and others do not; that must depend very largely on the persons themselves,—I mean to say on a person's mental condition. You can never tell beforehand how a man's mental condition will carry him through, as to whether he will suffer or not. You will find the strongest men sometimes when they get into that condition have their minds greatly affected in this way, and they get all these functional symptoms.

Then one also has to take into account hereditary influence, which no doubt plays a very important part. It is considered that these symptoms may be produced by what is called auto-suggestion, a word that has been used by Charcot, and he has shown that you can produce exactly the same symptoms in hysterical subjects when they are hypnotized. I remember when I was in Paris seeing a man in whom this condition was produced by simply hypnotizing him, and then giving him a little touch on the hip, and telling him at the same time that he had had a very severe blow, and that he felt tremendous pain, and instantly he complained of severe pain, and walked in the same way as these cases do after a real accident; thus showing that you can produce by suggestion in hysterical patients the same symptoms as are produced by a severe accident. As a rule, the point struck is the starting-point of the symptoms. So I take it that in these two cases both were struck in the back in the lumbar region, and in both you see it has affected the legs and not the arms, and the hyperæsthesia is most marked in the part where they were struck. In the case of the man it is entirely in the lumbar region; in the case of the boy it is

mostly in the dorsal, but it has also spread upward. So that in nearly all cases the point struck is the starting-point. On the other hand, this auto-suggestion will not explain every case.

In a great number of these cases the symptoms produced are those of hemi-anæsthesia, and this loss of sensation of half the individual may be produced by a general shock of the whole system without any particular part being damaged. I have, however, seen one case in the Great Northern Hospital, under Mr. Morton, of a girl who had some inflammation in the left eye, and that started on the same side functional hemi-anæsthesia, loss of hearing, loss of taste, and limitation of the field of vision in the same eye, with complete loss of colors; thereby showing that you may have hemi-anæsthesia produced by a local starting-point. But in most of these cases hemi-anæsthesia affecting one part of the body is simply an expression of lowered nutrition of the whole of the nervous system, and the left side is generally the first to be affected, as probably the left side of the body is inferior to the right. It is held by Dr. Hughlings Jackson that the right hemisphere is weaker than the left, and so the left half of the body would be more liable to an attack of hemi-anæsthesia than the right side.

HYPNOTISM.

CLINICAL LECTURE DELIVERED AT THE CHICAGO POLICLINIC.

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GENTLEMEN,—I might appropriately head this lecture with the couplet addressed by Hamlet to his friend,—

“There are more things in heaven and earth, Horatio,
Than are dreamed of in your philosophy.”

For I shall be unable to explain much of what I shall show you, and much of what I shall talk about still remains in that shadowy territory which lies between the known and unknown. The presentation of the subject, however, needs no apology. Hypnotism has too long been left in the hands of “fakirs,” catch-penny showmen, ignorant physicians, and charlatans, but in considering it I shall endeavor to bear in mind that we are busy, practical physicians, and shall exclude as far as may be all theoretical and historical considerations as well as bibliographical references, begging you in turn to remember that in the time at my disposal I can hope to give only an outline of the subject and to be merely suggestive, not at all exhaustive. And first I would ask your indulgence while we stop here the fraction of a minute to answer the question, “Is there such a thing as hypnotism?” Gentlemen, there is. No competent and unbiassed observer has ever investigated the question without coming to this conclusion. However investigators may disagree as to its nature, genesis, and possibilities, all agree that there is such a state as hypnosis, which may under certain circumstances be induced, and during which the mental and physical condition of the subject is more or less changed.

The question that naturally follows is “What is it?” To this no final answer can be given at this time. Some of the things which it

is not may easily be excluded, but we are not yet in a position to give a satisfactory definition, for scientific students equally astute and honest come to widely different conclusions. The majority of these students and practitioners of hypnotism may be divided in a general way into two groups, followers of the two so-called schools, the school of the Salpêtrière and the school of Nancy.¹

The founder of the former was the late Professor Charcot, of Paris, whose investigations were carried on at the hospital of the Salpêtrière. His experiments in hypnotism followed naturally and easily his fruitful study of hysteria, and he concluded that the former was a pathological entity, a disease, and very nearly related to the latter. In the more perfect subjects he made out three phases of the hypnotic state, lethargy, catalepsy, and somnambulism, each perfectly distinct, characterized by certain physical and psychic conditions, but easily changeable the one into the other. He believed that all forms and degrees of this state are simply variations or varieties of this type, which he called the "grand hypnotism," to correspond to the most severe and typical form of hysteria, "*la grande hystérie*."

The founder of the school of Nancy is Dr. Liébeault, who was for many years a "country practitioner" near that city, and long ago became interested in hypnotism. Some twenty years since he removed to Nancy, and after much opposition and unfriendly criticism finally succeeded in interesting Bernheim, professor of medicine, Beaunis, professor of physiology, and Liegois, professor in the law department of the Nancy faculty. These four are considered to constitute the head of the "school of Nancy." They hold that the hypnotic state is physiological and closely related to natural sleep, and, further, that it and all its manifestations are the result of suggestion. Regarding the nature of hypnotism, then, each school denies most of what the other affirms, but neither ventures to give a concise definition. It has been compared to and considered identical with animal magnetism, but there is no such thing as animal magnetism in the ordinary sense of the expression. There is a physiological generation of electricity in the body, for example, in the process of nerve-conduction, and electricity and magnetism are so intimately related that we might suppose the generation of an infinitesimal quantity of magnetism at the same time. Charcot showed that in some peculiarly susceptible persons with hysteria

¹ It seems almost superfluous to say that these schools are such in the broad sense of the word, as a school of philosophy, representing certain principles and theories, and are in no wise institutions for instruction in the principles and art of hypnotism.

a magnet seemed to have some influence aside from suggestion, but, as Dutil justly remarks, these experiments need to be repeated in the light of our later knowledge. Allowing considerable latitude to the term these phenomena might possibly be called animal magnetism. Some animals under certain manipulations pass into a more or less passive state. I have here an ordinary pigeon and a hen. They are not pets nor educated animals, but were bought a couple of days ago at a poultry market in South Water Street. I place the pigeon's head under its wing and move the bird rather rapidly in a circle for about a minute. When I put it down it remains perfectly quiet, tipped a little forward and to one side, its head still under the wing. I turn it over onto its back and it remains so, feet in the air and wings fallen away from the body. I do the same with the hen, and they remain in this unnatural position for a considerable length of time. We note that the pigeon has the eyes open, the hen has hers closed; for this I have no explanation. This peculiar passive state has also been said to be due to animal magnetism, but magnetism assuredly has nothing to do with it.

The term in its usual acceptance was introduced more than a hundred years ago by Mesmer to explain the peculiar results that he obtained by stroking certain persons with magnets. Later he learned from a Catholic priest that he could produce the same results by stroking with the hands and he discarded the magnets, but the term had been coined and remained. We now know that the strange manifestations demonstrated by Mesmer were identical with those of hypnotism, and were not due to the power of magnets, apparatus, or his personal organism. Indeed, this was shown in 1785 by a commission appointed by the king of France, and of which our own Franklin was a member. Hypnotism, then, is not an animal magnetism. But how are we to explain the induction of hypnosis in one person by another? An observation of the phenomena occurring during hypnosis, even if it does not furnish an adequate explanation, may throw some light on the nature of its genesis. The high degree of suggestibility in a deeply hypnotized subject depends not upon what is said to him nor how it is said, but upon the fact that the patient, or perhaps I would better say the mind of the patient, accepts it as true, the higher mental powers, the judgment, the critical faculty being in abeyance, or a state of inhibition. It makes no difference if the statement, or command, be conveyed in words, in writing, or by gesture, the result is the same. In some rare cases, indeed, a mere sound or light or other sensory impression is sufficiently suggestive to the receptive mind of the subject to induce a train of hallucinations with appropriate and expressive post-

ures. In other words, it is necessary simply to make the communication, and the "will-power," "concentration," or "odillic force" (there is no such thing) has nothing to do with the result. When I say to a hypnotized patient "your right arm is paralyzed," I exert myself no more mentally or physically than when I say to you "it is a fine day." If in consequence of this statement the patient's arm is powerless, the paralysis depends upon the state of his mind, not in the least upon the state of mine. The degree of suggestibility in the hypnotic state varies. A patient may accept the suggestion that he cannot open his eyes, but not the one that he can feel nothing with his right hand, and he evinces in a lively way his perception of pain when you stick a pin into it. Another patient, however, accepts this suggestion and does not feel the pin-prick at all. To repeat, there are different degrees of susceptibility, of suggestibility, of passivity, call it what you will, during hypnosis, and that is just what we find in a study of the genesis of the state. Some subjects are susceptible and some are not, and the operator's mind, his "will-power," his "animal magnetism," is a most unimportant factor in the determining influences. For instance, this patient whom I will show you presently sleeps—is hypnotized—at word of command, and has done so from my first attempt, never having been previously hypnotized, never having seen another hypnotized, and yet I make no more effort than when I say "put out your tongue." Remember that the men who claim to succeed in the greatest percentage of cases (the followers of the school of Nancy) make no effort of the mind whatever, at least not a bit more than the mere effort of communication. Remember that some operators hypnotize their patients by simply placing them in front of a revolving mirror or some such mechanical device and leaving them there till they go to sleep. Remember that patients have been hypnotized by a sudden bright light or loud sound without the knowledge or intervention of a second person. Indeed, this psychic state may be so favorable that no external influence whatever is to be discovered, and the patient falls spontaneously into the hypnotic state,—auto-hypnotism, generally due to auto-suggestion, which may be conscious, but is more usually subconscious,—and yet we read, even to-day, such expressions as "this peculiar force" and "the *will* of the operator first influences by making a decided impression," etc., and that by a bachelor of arts and doctor of medicine.¹

But I hasten to add that the belief of the patient in a mysterious force and your peculiar power may have a very decided influence in

¹ W. Henry Price, *International Medical Magazine*, May, 1894.

making him susceptible, and even the belief of the operator himself may have a like influence, simply because his consequent confidence and assurance conduces indirectly to that psychic state of the patient which makes him obedient, unquestioning, passive.

In other words, gentlemen, hypnotism is a subjective phenomenon, depending entirely upon the nature and state of the subject, the person hypnotized. This, of course, may be influenced by many things,—the place, the environment, the persons present, disturbing noises, the object for which hypnosis is induced, and with these naturally the personality and conduct of the hypnotizer; but we are not to suppose for a moment that there is in play a “hypnotic power,” that a peculiar, unique, and mysterious influence goes out from the person of the operator, the stronger, which takes charge of and influences the personality of the subject, the weaker. If we will bear this in mind it will make clear to us many of the vexing questions of hypnotism.

We may conclude that we know something about hypnotism, but we do not know what it is. When we hypnotize a patient and he lies quietly, with eyes closed, breathing regularly, apparently unconscious, but rouses if loudly spoken to or pricked with a pin, while if left alone he continues to slumber for some time and finally awakes from what he considers to be a natural sleep, and what to most appearances is natural sleep, and when we see Bernheim and some of his followers succeed in inducing such a hypnosis in eighty per cent. of their patients, we are inclined to say with the Nancy school that hypnotism is physiological and nearly related to sleep. When, on the other hand, we see violent, hysterical convulsions caused by hypnotism or the hypnotic attempt, when the patient awakes dazed, dizzy, uncomfortable, when we see by suggestion in the hypnotic state a blister produced by a cold key or coin, when we see induced an auto-hypnosis that can scarcely be distinguished from different phases of grave hysteria, we would fain vote with the school of the Salpêtrière that hypnotism is a disease and closely related to hysteria.

I may here parenthetically and very briefly touch upon the question of thought transference, telepathy, hypnotism at a distance, and vicarious sensation. You probably all know something of the experiments of Luys, who intoxicates the hypnotized person by rubbing a scaled bottle of brandy on his head, makes him feel the pins stuck into a wooden dummy in the next room, or stuck into the air where an amputated member would be if present. I can only stop to say that these experiments have never been adequately confirmed by other observers. The same may be said of thought transference and hypnotism at a

distance in the proper and ordinary sense of the expression. In one way there might be said to be hypnotism at a distance, but it is really post-hypnotic or ordinary suggestion. An example will serve as explanation. One of the patients before you, while in the hospital, was troubled with insomnia, and I was led to try the following experiment: I told her that exactly at nine o'clock she should think of me and imagine that I sat in the place I usually occupied when I hypnotized her; that I would think of her; that she should count nine, and that when she reached nine she would fall asleep, as I would put her to sleep from my home. She carried out directions, and the result was all that could be desired, although, needless to say, I had not my thoughts upon her at all.

Apropos of the phenomena of hypnotism, I venture to mention what would seem quite self-evident, but what an English author has been at great pains to prove, that all kinds of frauds and deceptions have been practised upon a curious and gullible public, and that honest investigators have been wilfully deceived by designing subjects.

Now a word as to the practical value of hypnotism, and here for most of us lies the vital question. What proportion of my patients shall I be able to hypnotize, and, once hypnotized, how much good shall I be able to do with it? In what cases is it indicated, when contra-indicated, may it be injurious in its immediate or remote effects, and how am I to induce hypnosis?

Here again, gentlemen, I am unable to give you concise and final answers. The highest authorities differ radically. I could give you in a sentence my own opinion, but it of itself is worth no more than that of many another man, and we have no time to-day for polemics and extended citations. Remember, moreover, that, as intimated before, the answers will depend to a considerable degree on circumstances, and the tact, judgment, experience, and diagnostic skill of the physician. The mortality of amputation at the hip depends on the ability of the operator, the character of the disease or injury, the constitution of the patient, the surroundings, nursing, etc., and likewise many elements enter into the determination of the practical value of hypnotism. And please remember that hypnotism constitutes no "short cut" to therapeutic success. In medicine as in other walks of life there is no "royal road to fortune," and he who would use this diagnostic and therapeutic aid must be the careful, sensible, wise physician still.

But to come to the point, I should say that you ought to succeed in hypnotizing ten to twenty per cent. of your patients; some of you

considerably less, some possibly more. Bernheim claims to succeed in about ninety per cent. of his cases. According to my observations in his wards in the Municipal Hospital of Nancy he succeeds in seventy-five to eighty per cent., counting all degrees of hypnosis. But his conditions are exceptionally favorable. His reputation as a hypnotist is great and patients never doubt that he will succeed. They see others hypnotized every day, it is part of the regular routine, and they take it as a matter of course, the same as any other medicine, without question, fear, curiosity, or amusement. Then his authority is absolute, or rather the obedience and submission of the patients is absolute, and you will find that it is those accustomed to obey who make the best subjects.

Charcot and his followers maintain that not over twenty per cent. of patients (ordinarily less) may be hypnotized, because the subjects must have hysteria or a hysterical tendency. In this they are certainly wrong, but it is a fact that the majority, not all, of the best subjects are those who have, have had, or may have hysteria. Dr. William Lee Howard, of Baltimore, one of the most successful operators in this country, claims to succeed in about thirty per cent. of his attempts.

What can we cure or relieve by hypnotism? The followers of the school of Nancy claim that it may be of greater or less utility in nearly every known disease,—not necessarily as a curative agent, but as a palliative to relieve distressing symptoms.

The school of the Salpêtrière teaches that it is of use only in hysteria and not always then. As to the claims of the school of Nancy, I saw Bernheim use hypnotism in the following cases:¹ Secondary syphilis and mild infection following premature delivery, 1 case; alcoholic multiple neuritis, 1; myelitis, 2; tuberculosis, 3; chronic gastritis (dilatation of stomach), 2; chlorosis, 1; subacute bronchitis, 1; asthma and emphysema with chronic bronchitis, 1; rheumatism, 4; jaundice, 1; tumor of liver, 1; alcoholism, 1; mitral disease, 2; typhoid fever, 2; apoplexy (hemorrhage), 1; diabetes mellitus, 1; exophthalmic goitre, 1; hysteria, 5; epilepsy, 1.

As I have just intimated, hypnotism was not used in all these organic cases with the idea of restoring pathological tissues, but to relieve symptoms; cough and vomiting in phthisis, pain in rheumatism, headache in typhoid fever, etc. But did it do this? Did it make these patients more comfortable, did it relieve their pains and head-

¹ Hypnotism at Nancy. Chicago Medical Recorder, February, 1895.

aches and make them sleep? It did not to any marked degree. In some of the hysterical cases the improvement was striking. And apropos of "functional" and "organic" cases I wish to insert a word bearing upon the estimation of the results of others with psychotherapy and upon the selection of cases for such treatment. Let me again emphasize what I have so often insisted upon, that we may have a combination of organic and functional trouble, entirely fortuitous, or organic disease may be the exciting cause of hysteria in a previously healthy individual. A woman has an abdominal tumor which causes certain pains and other annoying symptoms; finally the effect of this on her mind, be the process conscious or subconscious, is to induce the appearance of numerous other pains and troubles which are purely functional. I know at present of just such a case. A man has locomotor ataxia and consequently difficulty in standing and especially in getting across a crowded street promptly. This, not unnaturally, makes him anxious and timid, and presently we have grafted upon his spinal ataxia an uncertainty in station and locomotion which is of purely mental origin, but quite as real as the other. A man suffers a severe contusion of the shoulder which is very painful and disables him for some time. Long after the integrity of the tissues is entirely restored he is very weak in the arm and cannot use it without pain,—that is, a functional affection has been left over when all organic disease has ceased. In all such cases hypnotism may be of signal service in the diagnosis as well as treatment, removing all of the functional element. I have seen a case of hemiplegia from cerebral hemorrhage with a hemianæsthesia of functional origin, in which the latter was removed by hypnotism, the former remaining unchanged. But in some cases we may do more than this by hypnotism. When I hypnotize a subject and make him insensible to pin-pricks I do not prevent conduction of this irritation to the sensorium, but merely the recognition of it. The patient neglects or refuses to recognize the pain. If the patient is very susceptible to suggestion he will fail to recognize very painful impressions, such as the extraction of a tooth, and so in the most profound hypnosis surgical operations may be performed without pain. As a matter of fact, however, subjects as good as this are rare, and the field of hypnotism in practical surgery has been found to be very limited. As we may at times induce anæsthesia in surgical cases so may we also in medical cases. The pains of locomotor ataxia, rheumatism, neuralgia, etc., may be relieved, but the relief is, as a rule, not enduring, and in the more severe cases very good subjects are necessary to success. It is quite certain that in these exceptionally

good cases the bowels may be regulated, appetite increased, cough and especially insomnia alleviated.

There is no doubt about the efficacy of hypnotism in that omnivagant disease hysteria. There is scarcely a symptom in all its multifarious manifestations that has not been removed by suggestion during hypnosis. Pain and anæsthesia, paralysis, spasm, and contracture, affections of the digestive and genito-urinary systems, Raynaud's disease, erythromelalgia, polyuria, anuria, convulsions, affections of the special senses, what not? This patient may serve as an example. She was brought to the hospital some months ago apparently suffering from acute cerebro-spinal meningitis complicated with absolute blindness and with deafness of the left ear, both of only a couple of days' duration. A careful examination convinced me that it was a case of hysteria, and suggestion during hypnosis removed most of her symptoms with wonderful rapidity. But I need scarcely remind you that not all hysterics can be hypnotized, and, even when hypnotized, not all are sufficiently suggestible to make the results gratifying. Indeed, some observers complain that, although frequently able to induce hypnosis, they are unable to accomplish anything by it.

Has hypnotism a deleterious effect upon the individual? First, as to the immediate effects. In hysterical subjects it not rarely occasions an hysterical outbreak of one form or another, and this is independent of the method used. The attacks thus produced are ordinarily of short duration and easily controlled, but they are occasionally very troublesome and refractory to treatment. Following the hypnosis patients often, indeed as a rule, complain of some dizziness or somnolence, or a "queer feeling" in the head, and this may be sufficiently intense to make even good subjects very loath to be hypnotized. These unpleasant feelings may, however, be disregarded if we are doing our patient good, as may also the rare difficulty of being unable to awaken the patient. This does no particular harm, as he (or she) will awaken spontaneously after a time if left alone. All these untoward effects may ordinarily be prevented or reduced to a minimum by suggestion during the hypnosis.

As to the remote effects it is not so easy to speak positively, for here again authorities differ widely, as widely as positive affirmation and negation. It would seem to depend largely upon circumstances. If the patient comes to feel that he has no will-power of his own, that he is the mere puppet of another, and thus loses his self-reliance and feeling of personal responsibility, the result is certainly deplorable; worse, if he is convinced that the operator has some "mysterious

power" over him, body and mind, and can compel him to anything. I need not trace the steps of the process, for you to see that nothing could be worse for a neurotic, or indeed any other subject. On the other hand, if we use hypnotism in a simple and rational way, as we do pills, powders, and potions, in properly selected cases, abstain from experimentation and all airs of mystery and power,—use it, in other words, with common sense and reason,—I believe it may at times be used, not only without harm, but even, as an adjunct, to strengthen an already tottering will-power and to restore nervous balance. But again let me call to mind that it is sometimes this very faith in your "power," this implicit obedience and renunciation of self, this belief in a mysterious influence, which makes your patient a good subject, so that we find we have travelled in a circle and have found one of the practical limitations of hypnotism.

Before passing on to the *modus operandi* of inducing hypnosis I should perhaps say a word as to the medico-legal relations and importance of hypnotism. May one person cause another unconsciously or against his will to commit a crime? Individuals of a degenerate type, as criminals, who have already an abnormal tendency, are very suggestible along the line of this tendency. This like every pathological state grades off into the normal or simply peculiar. A boy reads a few dime novels about bloody deeds in the wild West, and, with a certain predisposition, the proposition of another boy that they go and do likewise is enough to send him off with his belt full of weapons and his head full of delusions. The details of a peculiar crime are published by the daily papers and straightway similar ones follow. Some unhappy soul takes himself out of this world in a novel way, and the recital of the details is a sufficiently powerful suggestion to move others to follow along the same path. A confidential clerk is at heart dishonest, but has no idea of theft until an open safe-door and a free exit impel him to crime. In all of these cases we may easily believe that direct suggestion during hypnosis might be equally efficient, but you can see that the hypnotism would really play an unimportant rôle and would not relieve the person from responsibility. In a normal individual the details of crime excite only horror and repulsion, and it is not likely that in such an individual hypnotism would be able to overcome the natural repugnance. (Repugnance born of a fear of the law would act in the same way.) At least no such case has ever been conclusively proved. It is not difficult to induce a good subject to steal the doctor's watch or stab a spectator with a card-board knife, but such experiments are not conclusive, for it is practically

impossible to prove that the subject is not conscious that it is an experiment.

Regarding the cases of which one hears so often through the public press, the great majority fall into one of two categories,—

1. Insanity of the variety called paranoia.
2. Hysteria, often of a similar type.

The first is easily understood. These are the patients with fixed delusions, often hallucinations. In times of religious agitation they are the messiahs, the saints, the Virgin Marys; in times of political or military excitement they are the presidents, governors, generals; when electricity is a prominent topic they are apt to be controlled, persecuted by electric currents; in former days (and at times still) it was the Free Masons who took mysterious possession of the person's will, and now we see occasionally a patient who attributes it all to hypnotism. These persons may be not only rational on most other subjects but exceedingly astute.

An hysterical patient may have attacks of convulsions, catalepsy, narcolepsy, or other peculiar states which she, being very suggestible, persuades herself or is persuaded are due to hypnotic control.

But as physicians and scientists we must ever be careful about saying "impossible," and this postulate applies to our position in regard to the rôle hypnotism may play in crime. Although it has never been conclusively shown that an innocent person may be made to commit a crime, although laboratory tests are not conclusive, and although to many of us it seems highly improbable that it could be done, yet when we think of the strange, ridiculous, painful, and disgusting ordeals that hypnotized subjects may be made to submit to, it behooves us, in the present state of our knowledge, to abstain from saying that an exceptionally susceptible and well-trained subject might not be made to commit an act to which nothing could tempt him in his usual state of mind.

There are four principal methods of inducing hypnosis: causing the patient to look steadily at a revolving mirror or colored glass disks, causing him to regard fixedly some object (preferably a bright one) held about eight inches in front of and five inches above the eyes, stroking or passes, and simple suggestion. The first is not largely used and has few advantages. With the second method suggestion is generally combined, as I shall show you. In using the third method, you sit facing the patient, begin by stroking with both hands the forehead from the middle line to the temples, then passing from the forehead down the sides of the face and neck, and finally a long stroke

along the arms to the finger-tips, the procedure occupying two to five or six minutes. At the last it is customary to add suggestion. I have succeeded with this method after failing with others. The school of Nancy teaches that suggestion is the key-note of hypnotism; that all methods are only different means of suggestion, and that hypnosis is impossible without it. They consequently use suggestion only, without accessories.

I can illustrate this method on this young woman. As I told you a few moments ago, she can be hypnotized by a single command, but I shall proceed as if I were making the attempt for the first time. I place my hand on her forehead, ask her to look at me, to keep her attention, and say quietly but positively, "Now you are going to go to sleep. Your head is beginning to feel dull and heavy. Your eyes are getting tired, the eyelids are heavy. You're getting very sleepy, duller and duller, eyelids are heavier, your eyes are closing, closing; now you are going, your eyes are closed and you are sound asleep." As I finish I pass my hand down and close the eyes. Then I continue, 'Now you're sound asleep, deep asleep, your eyes are closed and you can't open them. Sound asleep, deep asleep, deeper yet. Now you are sound asleep, your eyes are closed and you can't open them. You could not possibly open them if you tried ever so hard. Try to open your eyes. You can't open them, not a bit. Try harder, harder yet.' As you see, she apparently tries to open her eyes and cannot. I raise her arm in the air and say, "Your arm is stiff just like a bar of iron and you cannot bend it," and you see she is unable to do so. I stroke it and say, "It is getting numb, all the feeling is going out of it; now the feeling is all gone, you can feel nothing with it, nothing at all," and she apparently feels nothing of this pin as I thrust it through a fold of the skin.

To give you an example of post-hypnotic suggestion I tell her that she cannot put her arm down until I give her leave; that when I awake her her arm will still remain above her head and that it will stay there until I tell her to put it down. I say further, "When I count three you will wake up feeling bright and fresh, with no headache, no dizziness, no queer feeling in your head but perfectly clear and well, but you will not be able to put your arm down until I tell you." I count three, she awakes as if from a sleep, but her arm remains in the air, and try as she will she cannot put it down until I say, "that's all right, now put it down."

This man I hypnotize by the method of fixation. I hold a small, bright object, which happens to be a palpebral retractor, in a position

that makes him converge and look upward. After a few moments I notice the pupils dilate somewhat, I make a few suggestions as in the first case, finally close the eyes and continue the suggestions as before. In this case, however, I do not succeed in inducing a complete analgesia ; he winces when I thrust a pin deeply into his arm.

In suggestion for therapeutic purposes I think it well to touch or stroke, when practicable, the part concerning which the suggestion is being made, and the suggestion should be repeated a number of times, always in a positive manner, and made as emphatic as possible.

PRIMARY LATERAL SCLEROSIS; APHASIA AND ASSOCIATED DISTURBANCES; LITHÆMIC NEURASTHENIA; SCIATICA.

CLINICAL LECTURE DELIVERED AT THE MINNEAPOLIS COLLEGE OF PHYSICIANS AND SURGEONS.

BY LEO M. CRAFTS, B.L., M.D.,

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GENTLEMEN,—I have to present to you to-day several very interesting cases, and this is the first one. This man, Mr. B., thirty-six years old, of German parentage but born in this country, single, his habits have been temperate, and his course of life has been very even on the whole. A younger sister has advanced rheumatoid arthritis, which is rather unusual in one so young as she is, but there is no neurotic history to be obtained from the family. The man's early history was good, his general health was excellent up to a few years ago, except at one time, when he was about eleven or twelve years of age, he had peculiar attacks in which he would fall suddenly and was apparently helpless, but at such times he was conscious. These attacks soon disappeared and he had no further trouble, but we see in them a neuropathic tendency. At about twenty-four or twenty-five he had symptoms similar to these which he presents at present, the knees being weak, his legs tiring easily, and he had a good deal of difficulty in walking. The condition, however, improved under treatment and he felt perfectly well until the beginning of this attack.

About three years ago the present illness began with a tired and weak feeling in the legs and some difficulty in walking, the legs feeling stiff and uncomfortable, but it was not pronounced. He could get around and attend to his work. About two years ago last May this condition increased to a point at which he was no longer able to work. He had previous to this been employed by the street railway

company as cleaner of the motors, having to sit on the motor where part of the back was pretty hot and part of it cold, different parts of the back being subjected to great differences of temperature. How much of that is of etiological value we do not know. He was peculiarly healthy as a child, not having any of the acute diseases that are so common in early life, and there is no history of luetic infection at any time.

The stiffness of the legs increased and he had to stop work. His gait is very stiff, his legs have been so weak that he could scarcely walk, and he has practically been laid up. Aside from that he has felt very well, indeed, but finds he is unable to handle his legs on account of that condition. There has been no pain in the legs, and the only pain that he has had anywhere has been a slight one in the lumbar region of the back. That is all of the subjective side. Objectively, we have pretty pronounced symptoms which lead us to our diagnosis very easily. And if the patient will now walk for us we will see the peculiarity of the gait. You notice his walk is very stiff; that is the typical spastic gait of the paretic. You see how the feet scrape as he drags them along, and the whole leg moves stiffly.

On physical examination we find very striking symptoms. The knee-jerk is very pronounced, extremely exaggerated, and is about equal on both sides. Now, when I test for the ankle-clonus it is not so well developed on the right, but on the left it comes out beautifully and the whole leg is thrown into clonic contraction. There is no loss of muscle substance, no disturbance of sensation, and no involvement of the rectum or of the bladder. For objective signs, then, we have only the loss of the power of motion to a considerable extent, and a very marked increase of the patellar reflex, the presence of well-marked ankle-clonus, and the front tap is also well developed. There is really no condition with which this could be confounded.

The differential diagnosis is very plain. There are only two or three conditions that we need to consider. The first would be a diffuse myelitis, which can be located anywhere in the cord, but in this case, if it were myelitis, it would be located in the dorsal region above the lumbar enlargement. In that case you would have the same motor disturbances, but anæsthesia is always present and he has had no sensory disturbances at any time, and the bladder and rectum would also be involved, which rules out a transverse myelitis.

In locomotor ataxia the condition of the reflexes is entirely opposite, and the pupil would be immobile, while with this patient the pupillary reflex is normal and the gait is not ataxic but the opposite.

In ascending spinal paralysis, while the motor manifestations are similar, the onset is more sudden, the progress much more rapid, and the reflexes are quickly abolished. Hydromyelosis cannot be absolutely ruled out, as its symptom-complex is irregular, but it would hardly be possible to get so marked motor disturbances with no implication of the sensory tracts. Then we consider the only thing that this can be, and that is primary lateral sclerosis, or, another term, spastic spinal paralysis. This condition was first described by Charcot a few years ago, and by Erb at about the same time, the two descriptions agreeing exactly. It is not at all rare, and yet not very common. Theoretically, there should be only a sclerotic condition of the lateral—that is, the motor—regions of the cord, but in cases that have come to autopsy, while this was the most characteristic lesion, other parts have also been involved, and his symptoms are typical of such a process.

On the prognosis of this condition, of course, where there has been an organic change in the fibres of the cord, we do not expect therapeutic measures to be of curative service, and so our treatment is palliative, and, as far as possible, to prevent further extension and development of the process with the possible restoration of fibres that have been encroached upon and compressed by the infiltration, but that have not been destroyed, and in that way get an apparent improvement in the case.

This man has been under observation for about six months and has shown decided improvement up to a certain point, but of late his condition has remained stationary. The course of the disease is one of very long duration usually. It may be entirely confined to the legs, not extending to the arms at all, or it may gradually extend up the pyramidal tracts and involve the arms as well with the same symptoms as in the lower extremities.

Now, as to treatment, it is along the line of palliation. If you have any history of specific infection, you direct your treatment to that, but, if there is not, the iodides are of value in accomplishing the resolution of inflammatory products and newly-formed tissue not syphilitic in character. Nitrate of silver may be tried, and warm baths diminish the spastic condition of the muscles. Electricity properly used is of great service. You would apply the galvanic current centrally over the spinal cord—from ten to twenty milliamperes—labile, using the ascending current for the most part, but occasionally passing it in the opposite direction, and also use the combined currents over the lower extremities. But you must be careful in the use of the faradic current, as it may do harm when used over the nerve trunks in

the condition in which these are. The value of other internal medication is doubtful. Whether strychnine is of any use is uncertain, while ergot in the form of the fluid extract may perhaps be employed to advantage. Aside from these things little can be done except that we give attention to the general condition of the patient, building up the general system, and in that way placing him in a position to resist further extension of the degenerative process. But beyond this, we are powerless, and the patient will probably continue in this partially disabled state for an indefinite number of years.

APHASIA AND ASSOCIATED DISTURBANCES.

CASE II.—Miss S., twenty-five years old, American parentage. Of the family history and the previous history of the patient we can get almost nothing. Very little can be gained from the patient on the subject, so that we do not know what may have been the antecedents of this condition. The present illness, we have learned, began in May last,—that is, about five months ago,—and came on gradually. She noticed first that she began to lose the power to use the right foot and leg and then the arm, and that also she was unable to speak as she had been able to do formerly. But whether the trouble with her speech began at about the same time or later we do not know, and cannot determine accurately.

There has not been at any time any disturbance of sensation: all the symptoms are of motor disturbance, apparently, so far as the extremities go, and nothing of a sensory nature. There has been, probably, no parietic disturbance of the side of the face, as we would expect. The face is symmetrical, and apparently it has not been involved, as has the right arm and leg. She has had some trouble with the left ear,—but of what nature we have not been able to learn.

On physical examination we find that there is considerable impediment in the motion of both arm and leg; that she walks with a spastic gait, hitching the foot along, dragging the toe, and that the arm cannot be used to any great extent. There is occasional tonic contraction of the arm and hand, and sometimes slight rhythmical clonic contraction of the fingers. The pupils we find moderately dilated, but they react fairly both to light and to accommodation. The right is somewhat larger than the left, and apparently reacts to light rather less than the left. The tongue comes out nearly in the median line but slightly deflected, and moves in all directions with freedom. There is no apparent paresis of the mouth or palate or any of the intrinsic muscles of the mechanism of speech.

On examination of the arm and leg, we find that there is moderate atrophy of the muscles of the thenar and hypothenar eminences, but not much. There is considerable atrophy of the forearm and upper arm as compared with the other. The leg does not show any appreciable loss of substance anywhere. On examining the tendon reflexes, we find that there is decided increase both in the arm and the leg. The knee-jerk is exaggerated and the reflexes at the wrist and elbows are quite decidedly increased also. But there is no ankle-clonus to be elicited. There is no cardiac complication and the urine is normal.

On endeavoring to talk with the patient, we find that something is wrong immediately; that you do not get answers to questions. Questioning her further, it is found that all the control of language she has is just a few words like "yes," "no," "I don't know." In response to questions that are put to her, she will use one or two words correctly, and then there is a repetition of a number of unintelligible syllables of which you can make nothing. She repeats such syllables as "meta cos," "m—sada," and "mussetta," over and over again. "Meta cos" she will repeat five or six times, with the idea that she is talking rationally and intelligently. On further prosecuting the examination in regard to speech, we find apparently that she comprehends questions perfectly well, but once in a while it is evident that she does not catch the questions that are put to her.

Her answers to questions that can be answered by "yes" or "no" are almost invariably correct; but sometimes she will interpolate remarks when conversation is not addressed to her, remarks that are not at all germane to the conversation that is going on, showing that there is some disturbance of the powers of conception on the psychical side, and this emotional state which you observe is common in all brain lesions. When several objects are placed before her, she is usually able to select the right one each time. When you speak the name of it she will take from the number of objects in line any one you ask for, indicating that she recognizes the object; there is, therefore, no apraxia. But if you write the name of the object to be selected she is lost, cannot read it at all, indicating word blindness.

In the same way, ask her to pronounce words for you and she will not succeed in doing it, but will give some of these unintelligible syllables. She is conscious of the mistake but cannot correct it. Asked to pronounce "diet" she said "nuit." When asked to pronounce "N" she said "X," and the letter "O" said "ata." At one time she was able to speak the figures from "one" to "six" in rotation without any trouble, but asked to do it again, seemed to be unable to do so or re-

fused,—which, it was difficult to tell. Words that were pointed out to her, either in large or small print, she apparently could not appreciate and could not pronounce the words at all, indicating that she was entirely unable to read. We do not know whether she would be able to write or not, on account of the spastic condition of the hand, but probably she would not be able to write either. Then we have a condition of aphasia, which is largely of motor type, but there are other disturbances with it. The motor speech-lesion is very well marked, and is in fact almost monaphasic in character. Whether there is much of any word deafness, the inability to appreciate what is said to her, or not is a little doubtful, though there is indication that there is a slight disturbance of the appreciation of words spoken, so that there is evidently some involvement of the sensory centres. There is paraphasia, or mixing up of things, using the wrong letter, for when she tried to say “rare” she said “vare,” and other things which indicate its presence in a considerable degree. Amnesic aphasia is probably present to a slight extent, but it is difficult to determine whether she forgets or simply cannot speak the word which rises clearly into consciousness. I said that there was undoubtedly alexia or word blindness, as she cannot read at all, and that agraphia, or inability to write, cannot be tested. This presents to us the picture of the case as we have it before us, and it is now for us to determine what is the seat of the lesion, and what its character.

These aphasic conditions may be due to a variety of causes and conditions, our conclusions as to their location depending upon the extent and the variety of the disturbances. A neoplasm situated in the region of the anterior limb of the internal capsule and encroaching slightly on the motor tracts might account for it; but such characteristic symptoms as convulsions, headache, localized pain, and tenderness are wanting, and by far the commonest cause of aphasia, where we have it accompanied by such motor disturbances in the extremities as we have here, is that of embolism or thrombosis, which is much more common on the left than on the right. Of a series of cases reported by Seguin, in two hundred and forty-three the lesion was on the left, and only seventeen on the right side. In this case, considering the very gradual onset, we have undoubtedly thrombosis of the middle cerebral vessel on the left, probably due to specific disease of the vessel wall and implicating the cortical centres of motion of the extremities, also Broca's convolution, the visual tracts, the insula, and to a certain extent, but slightly, the first temporal convolution, in which is located the perception of heard sound. The condition will improve slightly,

we may say, on prognosis, depending, of course, on the amount of tissue that has been permanently injured by the occlusion of the vessel; but we know that there is sometimes very perfect restoration of the function in such cases, and since she has been under treatment in the City Hospital (about six weeks) there has been an appreciable improvement in the speech. The arm has less of the tonic contractions and the hand can be used, opened and shut, with rather more facility, decidedly less spastic, and I think she walks a little better. The improvement will be very slow and probably not very marked. Speech will in all likelihood never be regained to any considerable extent.

So far as treatment goes, little can be said, and we cannot hope to accomplish much. Our first resort is to specific remedies, the iodides, and they should be pushed to full doses, possibly combined with mercurials, the action of which may often be strikingly assisted by small doses of pilocarpine, perhaps one-eighth to one-twelfth of a grain at night. All the functions should be carefully regulated, and we may apply massage, baths, and electricity to the extremities; and so far as speech goes we should employ methodical gymnastics, by giving her simple words at first and then more complex ones, thus gradually developing a vocabulary. Very persistent efforts along that line may accomplish much in the restoration of speech, if the centre and sub-cortical region have not been too badly damaged; while if there has been extensive destruction we can expect to do but little, and the power of coherent speech is permanently lost.

LITHÆMIC NEURASTHENIA.

CASE III.—Miss N., of Swedish parentage. In the family history we find nothing of importance. There are no neuropathic disturbances in any members of the family so far as can be determined, and her health up to six or seven years ago was very good, when she began to have a good many subjective disturbances. There was some headache, a good deal of general malaise, too, and feeling tired, and she had considerable gastric disturbances. There was also some pain in the back of the neck and at the base of the spine, and a good deal of constipation; chronic constipation was quite marked.

These symptoms continued in this way for about three years, and she went to a sanitarium in Michigan for treatment. The surgeon there, having a good deal of enthusiasm on surgical procedures in the line of normal ovariectomy, thought this was a suitable case, and an operation was performed. Where he got indications for such operation it would be difficult to determine, and the very extensive use of

that procedure which has come into vogue in the last few years is entirely unwarrantable. The production of the artificial climacteric under these conditions cannot be otherwise than disastrous to a nervous system already very highly irritable and unstable.

She remained in the sanitarium for some time and was still weak when she left. A short time before she left she was upon the balcony upon the third or fourth floor, and happening to look down over the railing was seized with a sudden sense of fright of falling through space indefinitely. Since then she has had a great deal of the same sensation, and it is part of the nervous disturbance from which she is now suffering. This and the "phobias" are of common occurrence in these cases. She left the sanitarium, went home, and has since been troubled with very distressing symptoms. When first seen, something over six months ago, she was suffering from intense pain in the back, particularly the upper portion of the back, over the lower cervical region, and over the sacrum; the pain over the base of the spine being of a dragging character which was almost unendurable. There was no tenderness on pressure anywhere that could be elicited. She has also had intense headache and an indescribable feeling of pressure in the head. There is the characteristic morbid introspection. She is also very nervous and easily startled. The least thing coming unawares will make her start with a jump and cause pronounced flushing of the face. You notice that the facial expression is indicative of decided suffering and you can read there a history of pain. There has been pronounced vesical irritability: the bladder has required evacuation quite frequently and been accompanied by smarting and burning sensation. The urine is found to be high colored, of very high specific gravity, highly acid, and on microscopic examination is found to be loaded with uric acid crystals, the sediment being very heavy and of a brick-dust character.

The stomach has troubled the patient a great deal, and does somewhat still, but slightly now. There has been a great deal of pain in the back and the joints, particularly of the lower extremities. The hips have been at times very painful, and there has been intense pain in the knees, and sometimes slightly in the ankles, much more marked on the left than on the right, and when she gets down on the left knee and then rises there has been a crackling in the knee-joint that you could hear across the room,—very remarkable crepitus in that joint. The patient is unable to confine her attention to anything persistently. She finds concentration difficult from physical fatigue of application. On physical examination we find the pulse of high tension and the

heart's action somewhat irregular but no souffle, while the second sound is rather accentuated. The right shoulder droops, the tip and inner border of the right scapula falls away from the chest wall,—wing scapula. There is moderate spinal curvature to the left in the dorsal region. The head is thrown somewhat backward and carried stiffly, probably on account of the great pain in the cervical region. The patellar reflex is diminished on the right and almost absent on the left. There are no disturbances of sensation and no limitations of motion. But you notice that all movements of the hands are accompanied by nervous haste and a very characteristic tremor and uncertainty.

This clinical picture is perfect. There is nothing with which it can be confounded. The subjective manifestations, also the objective symptoms, make the diagnosis perfectly plain. The condition of the urine, the cracking joints, the painful back, the headache, and all the other symptoms are the typical congeries of lithæmic neurasthenia. How much of this is due to the operation is uncertain, but certainly there has been very pronounced aggravation of the case on account of it.

Now, as to the prognosis, a great deal of benefit can be obtained. There are few conditions which render the patient more miserable than this, and long-continued treatment, rightly directed, will accomplish a great deal. But it may also accomplish nothing, and, if not rightly directed, may produce injury. In all such cases especially the physician needs to carefully plan his treatment. Most carefully-planned and rational treatment is necessary, if you are to get any results at all.

This condition with the abnormal proteid metabolism, with increase of uric acid and other toxic by-products,—*i.e.*, a deficient oxidation,—in the first place is entirely functional ; but the abnormal products in the blood, acting as a continual irritant, will in time lead to organic changes unless treated aggressively and rationally. You have with this case an accelerated pulse of high tension, and a good deal of palpitation. If not given attention, the condition finally leads to a change in the vessel walls and arterio-capillary fibrosis, which may localize itself anywhere, but most frequently in the kidneys or in the brain ; and after the process has become organic and established it is, of course, too late. It should be treated before it reaches the organic stage. There is also irritability of temper, which is sometimes very pronounced, the patient flying into spasms of rage, even over trifles, or in milder cases showing diminished power of self-control and abnormal excitability.

In treatment the first thing is the diet, which must be very care-

fully arranged. It is better to give the patient a nitrogenous diet,—beef, mutton, poultry, fish, game, and oysters,—but avoid all starchy, sweet, and fatty matters. You may use some baked potatoes and toasted bread, and with these things you have an ideal nitrogenous diet. Then the condition of the liver should be looked after. It is usually clogged, and should be relieved. Your first resort is to suitable cholagogues, and then it may be well to give bile in some form, probably in capsules. There must be general constitutional treatment for the lithæmia, and also for the neurasthenic state. Central galvanism to the spine will do a great deal towards the relief of pain; local galvanism to the joints and general faradism and the combined currents are also very valuable, and will assist materially in relieving the pain in the joints, which is almost unendurable. Massage is of great service in changing the body fluids, removing waste products, and assisting the nutrition of the tissues. Nerve tonics and sedatives, as combinations of phosphorus, *cannabis indica*, or *hyoscyamus*, may be indicated. Baths, if used, must be used carefully, and Turkish and Russian baths must be employed with great caution, but they may be of decided service. Attention must also be paid to the condition of the urine, which gives us the indication of the presence of the uric acid in excess. Lithia should be administered in some form, either the natural waters or tablet preparations. Although this remedies the excessive acidity of the urine, these products of incomplete transformation may still be present in the body fluids, and we must not be deceived by it.

For the palpitation, which indicates both the neurasthenic state and the irritability from the abnormal products in the blood, nitroglycerin in one-hundredth-of-a-grain doses and iodide of sodium, five or ten grains, four or five times daily, are most serviceable. Now, such treatment, continued persistently and carefully over a long period of time, will do a great deal. This patient has improved decidedly in the last six months. The condition of insomnia was distracting and very exhausting, but has been relieved entirely by the treatment. She sleeps well almost every night. The dreams, which were harassing, have been very materially lessened, and she is troubled but little now. The pain in the cervical region is very much better. The pain at the base of the spine has been almost entirely relieved, and the painful joints are very much improved. The crackling in the joints, as she rises, has almost entirely disappeared.

The case, under continued treatment, will probably progress in steady improvement, and we may hope to get in the end very consider-

able relief from all of the symptoms and a very large restoration to health, but complete recovery from the combined lithæmic and neurasthenic states, when so extreme and long continued, cannot be assured.

SCIATICA.

CASE IV.—You will recall having seen this patient at the hospital some time since. A man of heavy frame and rather powerful physique, his health has always been perfect until the present trouble, and there is no venereal history. Last winter he strained his back, rolling a log, while at work in the pineries, and shortly afterwards chilled the left side badly, sleeping in a cold bunk. Severe pain developed immediately at the point of exit of the great sciatic nerve, and gradually extended to the calf of the leg, and was constant from that time, with varying intensity.

He has been in the hospital several months, in bed most of the time. He has been able to lie upon the left side or back for but a few moments at a time, and when standing the body was thrown strongly to the right (Fig. 1), the weight being carried in a line over the right leg, and any attempt to stand erect caused intense pain at the point of exit of the nerve, from pressure. In long-continued cases this forced position sometimes results in permanent scoliosis, and, although usually considered a typical attitude of sciatic neuralgia, it is very suspicious of disease of the sacro-iliac synchondrosis. But we can find no evidence in this case of implication of this joint.

Many mistakes are made in the diagnosis of sciatica. Processes in the joints, the bones, or the soft tissues are very frequently mistaken for it, and must be excluded by careful differentiation.

This case has proved very unyielding, and a wide range of medication has been resorted to. The limb has been given absolute rest. The salicylates were used freely at first, blisters were applied over the painful points, hot baths were resorted to, and oleum gaultherii was substituted for the salicyl derivatives, with little result. The Brown-Séquard pill was tried with some benefit, and antipyrin was also administered in five-grain doses, besides being given subcutaneously in the same amount in the vicinity of the nerve, and ten minims of a one-per-cent. solution of osmic acid were employed in the same way. The first injections of this were followed by a decided improvement; but later ones produced most acute pain, lasting for hours, and aggravated the whole condition. I then decided to resort to subcutaneous stretching. By this method the inelastic nerve can be stretched to its full limit, and all the dangers of open incision are avoided.

The patient was put under complete anaesthesia, and an expert masseur began the manipulations of the extremity, which many of you saw,—first, gentle movements of flexion and extension, with slight rotation of the joints. These were gradually increased until the whole limb was carried to the extreme limit of flexion, and this was repeated several times. The leg was then treated to delicate, followed by more vigorous, massage; percussing, kneading, and chopping movements, especially over the painful areas. He was then immobilized on a T splint reaching to the axilla. Although compelled to lie perfectly straight, there was now no pain along the course of the nerve. The splint was removed after five days, and he has since been able to lie with perfect comfort on the left side or back. There has been practically no pain in the nerve, and he sleeps well every night. He was kept in bed for about three weeks, and then allowed to get up tentatively. It is possible for him to stand nearly erect now without causing pain (Fig. 2), and he can sit easily and naturally, while formerly he was compelled to sit sidewise, with the leg extended.

Recovery is not yet quite complete, although there has been vast improvement, and continued massage and the static current would probably perfect the result. We cannot always assure recovery, as occasional cases may persist, or develop the character of a neuritis with loss of muscle substance, or in rare instances be the forerunner of cord disease.

This method of treatment was first reported by Dr. Comigor, and has not received the attention it merits. He enveloped the leg and pelvis in a plaster cast, which is preferable to a splint, as it avoids the discomfort of unequal pressure. This treatment is to be recommended in obstinate cases in which ordinary methods have failed, and is to be preferred to open incision, as it possesses all the merits of such procedure and more, while it is free from all its objections and risks.

[The patient continued to improve, and was discharged from the hospital entirely well about two months after the treatment outlined above was instituted.]



FIG. 1.—Patient with scoliosis of the left side standing with the body involuntarily inclined to the right.



FIG. 2.—The same patient in a more erect posture after a month's treatment.

HEMIPLEGIA.

CLINICAL LECTURE DELIVERED AT THE UNIVERSITY OF BUFFALO.

BY CHARLES CARY, M.D.,

Professor of Therapeutics in the University of Buffalo, New York.

GENTLEMEN,—C. B., aged fifty, a painter, suddenly became unconscious while working, and was found to be paralyzed on the right side. The previous history is unimportant except for the statement that some years ago he had syphilis. It was nearly two weeks after his admission to the hospital that he recovered consciousness, and it was several days later that he first showed any anxiety about himself, and was sensible enough to express a desire to recover. It is now five weeks since his admission, and the improvement that he has made is quite remarkable, considering the length of time that he remained unconscious.

On examining the patient you notice that his arteries are sclerosed, and that there is a well-marked arcus senilis around the iris. He can not wrinkle up his face, and he can scarcely whistle,—a good test for the degree of control over the labial muscles. Speech is somewhat interfered with, but the patient articulates “around the rugged rock” in a perfectly intelligible manner. He can grasp my hand, not forcibly, but we must remember that at the time of his stroke the hand was absolutely motionless. His tongue projects a little to the right. There is still complete loss of the patellar reflex. On the whole, the change from the absolute paralysis of five weeks ago, when the patient was practically dead, without power to move the right side of the body at all, speechless and unconscious, his bowels and bladder emptying themselves without control, is a very gratifying one.

By way of contrast, I want to show you this patient, a woman, aged fifty-three, Scotch, who has led the ordinary life of a housewife, has borne four children, and has had no illness previous to her present trouble. Eight months ago, following upon hard work, she became

suddenly unconscious, and was found to have left-sided hemiplegia. There was no aphasia.

Let us look into the present condition of this patient, as we did in the previous case. As I raise her left hand, you will see that it is contracted, and when I drop it, it falls lifeless. When the wrist is extended, the contraction of the tendons of the fingers hooks them over my hand, and so firm is the contracture that I could lift her from the bed without relaxing the flexion of the fingers. The elbow I can extend, though it usually lies in a state of flexion. The tongue is protruded pretty well, though it deviates a little to the left side. In noting a deviation of the tongue, do not measure by the lips, which may themselves be deflected, but by the incisor teeth. The left knee is permanently bent. The only interference with speech that this patient complains of is a little feeling of thickness of the tongue, due to some paralysis of the genio-hyoid muscles. In trying to elicit a history that would have some bearing on the development of her paralysis, the only significant points are that she had a good deal of severe headache for some weeks before the paralysis and that she has never used alcohol.

These two cases of paralysis, though different in their symptoms, are from one and the same cause, the breaking of a blood-vessel in the brain and the pouring out of an amount of blood varying with the size of the vessel. Such trouble is usually assigned to one of three underlying causes: (1) an arterio-capillary degeneration due to abuse of the arterial walls as a result of overwork, exposure, and various excesses; (2) the excessive use of alcohol, which usually leads to exposure to cold, muscular excesses, nerve-strain, and thus, indirectly and directly, tends to cause degeneration; (3) syphilitic disease. Of the three causes, the one which permits the greatest hope of recovery is the last. In the man's case you have seen a pretty plain indication of improvement. Brittleness of the arteries is a condition that develops in everybody as age advances. Very few people realize that, if they could see their own internal organs, they would in the passing years notice as much change as the mirror reflects in the case of the features. Some people look old at thirty, others at forty, and not only is there a change in appearance, but there is not the least doubt that, physiologically speaking, some are older at forty than others at seventy. The old saying that "a man is as old as he feels" is true, but it is still truer that "a man is as old as his arteries."

From any one of the three causes that I have mentioned, the arteries become thickened and less elastic, the heart becomes hypertrophied,

and, some time, when that person is stooping over, or straining, or coughing, or becomes suddenly angered, the extra blood-pressure happens to be sufficient to overcome the resistance of the coats of the arteries in the brain, and an apoplexy results. Commonly, from the increase in intracerebral pressure, the patient feels dizzy and falls, there is unconsciousness, and the face becomes livid. If the amount of blood poured out is great, complete coma comes on, the tongue drops back into the pharynx, the breathing becomes stertorous, the bowel and the bladder often give way, and defecation and micturition occur involuntarily. I do not doubt that, if we could get a clinical picture of this woman at the time of her stroke, we should see something of this sort.

It is often difficult to diagnose the condition of paralysis. Patients are not infrequently brought to a station-house under the suspicion of being drunk or are taken to a hospital as accident cases when they have been suddenly seized with paralysis. As you watch such patients, although there is a general loss of function, you will notice that the tongue, the muscles of the lips, or the hands and arms show a little greater tonicity on one side than on the other. Hold up an arm: if paralyzed, it will drop absolutely limp, while the non-paralyzed arm will drop with a little more sign of life. After a patient has lain in this state of profound paralysis for a variable length of time, depending largely upon the amount of blood poured out, he begins to breathe less heavily, and consciousness returns, sometimes within twenty-four hours. If, however, such patients do not rally at the end of a week or ten days, the case becomes very unpromising. The blood must be absorbed; very often a certain amount of brain tissue in the region of the clot softens and breaks down, and some other portion of the brain must take on the function of the degenerated part or a permanent loss of function results. The blood may also become encysted and remain as an aseptic foreign body. Again, there may be merely a staining with blood. In favorable cases, after eight or ten days the patient usually begins to mend, gradually recovers the control of his muscles, including those of speech, and the accident which has befallen him leaves comparatively slight traces, though it is seldom that perfect recovery takes place.

In this woman's case, when months have gone by, when, instead of the tone returning to the muscles, there has followed a degeneration of nerves, the permanent change in cerebral tissue must be considerable. The commonest symptom of secondary degeneration following cerebral hemorrhage is to be seen in this hand. The stronger muscles,

the flexors, have overcome the weaker, the extensors, and a permanent deformity remains, which is very characteristic of a paralysis of long standing. Commonly it is in the hand, not so commonly it occurs in the hand and leg together. You will notice, however, that this woman's right leg cannot be fully extended, it having become stiffened from lying in bed so long. How much the paralytic contracture has been exaggerated in the left leg I do not know. She should, at any rate, have been able to get out of bed months ago. Often you will see patients walking with a peculiar gait, the leg swinging from paralysis of the extensors; the arm and hand are also twisted in a very peculiar way. Usually the leg improves more rapidly and to a greater degree than the arm, so that patients are able to get about fairly well. Usually, too, such persons are not the younger members of the community, and it does not make so much difference to them,—at least, we think so. They are able to enjoy the quiet life commonly led by persons of advanced age. When these contractures begin, it is useless to hope for any return of function to the hand. The friends of the patients, as well as the patients themselves, will be happier, on the whole, if they know that they must learn to make the best possible use of the powers remaining to them, than if they are led along by false hopes to ultimate disappointment. I believe that, if this patient had been taken out of bed earlier than she was, and had tried to move about as well as she could, she would now have a less degree of prominent paralysis.

The condition of the arteries is usually associated with similar interstitial changes in the kidneys, constituting a gouty kidney; the retention of urea and other waste products causes headaches, the heart is apt to be hypertrophied, and there may be liver changes. I believe that it is rational to give such patients arterial sedatives.

The treatment of the paralysis must be divided into two parts,—first, that given at the time of the attack; second, the after-treatment. There is no similarity between the two. At the time when the hemorrhage is going on in the cerebrum, if you see the patient immediately and there is much arterial tension, venesection is an excellent practice, and it is also well to detract blood from the head by putting the feet in hot water. A similar effect is accomplished by administering a drastic cathartic, notably croton oil. I have in the city several patients who, for the last three or four years, have been taking nitro-glycerin regularly, for the purpose of overcoming a condition—not a disease, for it is an inevitable effect of age—of rigid, contracted arteries; and, as age advances, I always increase the dose.

The after-treatment of paralysis includes the general hygienic care

of the enfeebled patient, the attention to a great variety of symptoms that may arise, and the endeavor to diminish, as much as possible, the degenerative changes in the muscles. The last point of consideration refers to the use of massage, of electricity, particularly the faradic current, of various stimulating liniments, and of baths. The subject is so broad that I shall content myself with the briefest allusion to the means of treatment. The first patient shown you to-day is taking the usual mixed treatment of syphilis, and, under it, he has made great improvement, but we can scarcely reckon this as a treatment of the paralysis. Although potassium iodide is often given with the idea of causing the absorption of the clot and broken-down brain matter, it is very disappointing in its results, and, if such treatment is carried out at all, it is either with the hope that a paralysis may prove to be due to an underlying latent syphilis, or for the sake of making some effort to relieve an almost hopeless case.

Surgery.

A CASE OF SARCOMATOUS TUMOR OF THE UPPER JAWS.

CLINICAL LECTURE DELIVERED AT UNIVERSITY COLLEGE HOSPITAL.

BY MR. CHRISTOPHER HEATH, P.R.C.S.,

President of the Royal College of Surgeons of England; Surgeon to University College Hospital, etc., London, England.

GENTLEMEN,—Ten days ago you saw me operate on the patient who is now convalescing in the private ward No. 1, and whom you, or most of you, have just seen in a very satisfactory condition. I show you here photographs (Figs. 1 and 2) of the patient which were taken before the operation, and I will read you briefly the notes of the case. The man was fifty-one years of age, and he lived near Grantham. He had enjoyed good health—having nothing the matter with him at all—until about Christmas last, and then he noticed a small swelling about as big as the end of his little finger on the right side of the roof of the mouth, near the alveolar border; that began to grow somewhat rapidly, and it was lanced, but there was no discharge except a little blood. In March last the patient had it probed, and then plugged and syringed for a fortnight, but there was no discharge. Since then it has scarcely grown at all, he has had very little pain from it, except a little pricking sensation at times. When it is said here that the tumor has not grown, I mean that the growth in the palate has not increased, because, of course, at the same time that this was going on a general development of the tumor took place, producing the deformity which you see here very well in the photographs. Now, when he was admitted in September it was a very formidable-looking case. In the first place, I may say that the whole of the palate was involved, as I can show you in the preparation,—the tumor involved the whole of the hard palate, and the palate was absolutely flat. The soft palate was healthy, and you could put your finger round the margin of the soft palate and touch the posterior edge of the disease. So much for the mouth, except that there was one fact which I ought to note, and that is the separation of the incisor teeth. You see they are at con-



Figs. 1 and 2.—Epithelioma of both superior maxillæ.

siderable intervals, and I ought to note also that he had lost most of the other teeth. When we came to look at his face, we found, of course, a well-marked deformity there, affecting both sides. This photograph, perhaps, hardly does justice to the tumor, because the artist has not thrown the light on the left side. But you see here how the whole of the right cheek is bulged out, affecting the orbit, somewhat closing the eye and producing epiphora on that side. The left side of the enlargement was not so great, and there the orbit did not seem to be so much encroached upon, but still it was quite obvious that there was a mass of disease involving both the upper jaws and the whole of the hard palate. Now, the question of diagnosis of course arose, as to what was the probable nature of this tumor. It could not be an ordinary fibrous tumor, because the history was that of short duration,—only some six or seven months had gone by since it was first noticed. It certainly was not an osseous tumor, and the rapidity of its growth, and the general appearance of the growth so far as one could see, led me to conclude what proved to be the fact,—that it was a sarcomatous growth.

In regard to the pathology of these growths, remember that we have two forms of malignant disease in the upper jaw, sarcoma and carcinoma, and that sarcoma is the only one which really begins in the jaw, and may be entirely confined to that bone, and that proved to be the case here. I may say that the variety of sarcoma that one meets with in the jaw is either the spindle-celled or the round-celled, or very commonly a mixture of the two, as in this instance. If the case had been one of carcinomatous disease it would have been epithelioma, and you may have that of two kinds,—the squamous form, which begins very often in the palate, and spreads from the palate into the antrum, or sometimes begins on the nasal surface, and then spreads into the jaw. But there is in addition to that a form which begins only inside the jaw, in the antrum, and that is the columnar form. The columnar variety of epithelioma always begins in the mucous membrane of the antrum, where I may remind you the epithelium is columnar, and then it bulges out the jaw and forms a tumor, and that tumor invades the surrounding tissues, and eventually destroys the patient. Now, I was pretty sure that this was not a case of epithelioma from the general appearance of the mass of the growth. Epithelioma of both forms is generally softer than this tumor was, and it spreads so rapidly, and involves all the surrounding fissures of the skull so readily, that if you have a few months' growth you really find the disease beyond treatment. This patient I hoped was not beyond

treatment, and I was correct in my prognosis on that matter. Accordingly, I made up my mind that I would operate, and on last Wednesday week, October 2, I performed the operation which I am about to describe to you.

Now, in most cases of operation upon the jaw I do not do tracheotomy or laryngotomy. I think in the majority of cases it is not necessary, and it adds a little risk perhaps to the operation, and I think that with judicious care you may obviate the danger of blood getting into the windpipe. It has been suggested by some surgeons that you should invert the patient in all cases of removal of the upper jaw, with the object of the blood draining away without going into the windpipe,—the windpipe in fact being the upper part. I have tried that method, and I have found it to be extremely inconvenient, so inconvenient that practically I never do it, because I find that if the patient's head is inverted and held down, it is impossible to get at it with sufficient ease to perform an important operation. Therefore I made up my mind that in treating this patient, in whom, from the condition of the palate, there must be necessarily some considerable risk, I would do a preliminary laryngotomy. I always prefer laryngotomy to tracheotomy because it is a very much easier operation. In the performance of tracheotomy you may divide the vessels which lie in the median line of the neck, and hemorrhage result, so that it is by no means an easy operation, and therefore it seems a pity to run the risk of a serious proceeding when the very simple operation of laryngotomy answers every purpose. If you feel in your own necks you will find the prominence of the cricoid cartilage, and immediately above that is a space filled in by the cricoid thyroid membrane, and it was there that I made my incision transversely, and I at once opened the windpipe. Now, in this particular case I had provided myself with one of Trendelenberg's laryngotomy tubes, fitted with a cap of India-rubber, which I was able to distend, so as to prevent any possibility of blood getting past the tube into the lungs. But we found practically that the tube was too large. I got it in with some difficulty, and then, if you will remember, the patient ceased to breathe, and we had to take out that large tube and put in a smaller one, and then with a little trouble we got the patient to breathe again, and all went right, and I have no doubt that the great size of the tube somewhat distended the windpipe, and probably by reflex action prevented the patient from breathing.

Having got the patient, then, thoroughly under an anæsthetic, which was, of course, given through the laryngotomy tube as soon as it was tied in, I plugged the pharynx with a sponge, and then pro-

ceeded to perform the operation. I first divided the upper lip, as I always do, in the middle line, and then carried the incision into the right nostril, and subsequently made an incision down the right side of the nose, joining it round the ala of the nose, and I found, as I had expected, that by that incision I was able to do all that I wanted. Now, that is an incision which was, I believe, first used in this very theatre by Liston, many years ago. It was afterwards adopted by Fergusson, and it is generally known as Fergusson's incision. It is a very much better incision than the ones which were used before that time, and which, I believe, are sometimes used now,—viz., a free incision across the face from the angle of the mouth. You will see that patient lying in his bed, with hardly any mark to be seen, and within a fortnight, when he goes out, you will observe that the scar is hardly perceptible. There is a scar in the middle line, which will be hidden by his moustache, but the scar by the right side of the nose will hardly be seen afterwards, because it falls into the shade,—the shadow of the nose, of course, concealing it. Having made that incision, I was then able to dissect up the tissues of the face, and I found, as I had anticipated, that the septum of the nose prevented me getting at the upper surface of the tumor, and I therefore nipped through the septum of the nose with a pair of bone-forceps, and lifted up the whole of the nose, and was then able to get at the upper limit of the tumor. I was glad to find, as I had hoped, that there was a distinct round border to the tumor, and I may remind you that with the fingers, rather than with instruments, I defined the border, and got my fingers round behind it in order to depress the growth and enucleate it. The reason that I preferred to use my fingers rather than instruments there was because of the danger of entering the cranial cavity. You recall that I was actually inside of the cranium, because the tumor had encroached upon that cavity, having destroyed a very large part of the ethmoid. Now, there is nothing that separates the sinuses of the ethmoid bone from the cavity of the cranium except that very thin plate which we call the cribriform plate, hence it is very easy—and I am sorry to say it has been done more than once—to poke an instrument right through the cribriform plate and instantly kill your patient. Therefore I preferred using my fingers, and, getting above the tumor, I used some considerable force and tried to dislodge it from its position, but I found I could not manage it satisfactorily, so I was obliged to use a bone-elevator, and then pressing forcibly with that, I at last managed to deliver this large mass which you see here.

Let me demonstrate upon this what the different parts are. There

is the most prominent portion, which invaded his right upper jaw and orbit; there is the least prominent, which invaded the left upper jaw, and between the two you can see the cut line of the septum of the nose, where I ran my bone forceps along, and divided it in order to free the tumor. Then at the back you will see that I did not get it away quite cleanly. It seems to have come away quite cleanly on the left side, but on the right side I noticed as soon as I had torn the tumor away—and of course I divided the soft palate with scissors—I found there was still a piece left behind, and there is the piece. You see I had dislodged the bulk of the growth, and then I went back and took away this small portion which was left there attached to the sphenoid cavity, and reaching back, I have no doubt, to the sphenoid bone. However, I made sure I had taken everything away, and you will remember that the hemorrhage was extremely slight. We did use a cautery just to touch a few little vessels, but really there was no bleeding of a serious nature, and I was able then to apply iodoform freely to the cavity, to bring the lip together with harelip pins, and the rest of the incision with sutures, and I got the patient back to bed in a fairly good condition.

Now, that good condition, I am happy to say, has lasted until the present time. We stimulated him freely at first, because, of course, an operation of this kind produces considerable shock. I ought to have mentioned, by the way, that before the operation he had an enema of two ounces of brandy with four ounces of hot water thrown into the rectum, and I would strongly recommend you all to adopt that method in cases of severe operation, where the patient may be liable to lose a good deal of blood. It certainly does give a certain amount of "stand-by" and resource, upon which the patient will call during the operation. Not only did this man have an injection then, but he also had an injection upon the table during the operation, which was necessarily a long one. The whole operation took nearly an hour, and he had another injection when he got back to bed; and as soon as he could swallow we gave him some brandy by the mouth, and I was happy to find that he very rapidly rallied; and when I saw him in the evening his condition was extremely comfortable, and he has had no drawback since.

Now, what are the prospects of the patient? I think I have removed the whole of the diseased tissue, and I see no reason at all why he should not get perfectly well, and remain so for an indefinite period. Of course, there is a liability in all these cases to recurrence. The liability in cases of sarcoma is not nearly so great as in cases of carci-

noma ; and I hope, being quite sure that I have removed the whole of the disease, that he will have no further trouble. There is one difficulty which I think we shall have to get over, and that is that he has practically lost all support for the nose ; and I am a little afraid that in process of time the nose will flatten in, very much as you see in patients who have lost a large piece of the septum through syphilitic disease. I want to guard against that, if we can, by having some form of artificial palate fitted with a support for the nose. I have already spoken to our dentist upon the subject ; but of course there are very great difficulties in the way, because we have here no part of the palate left to which an artificial apparatus could be fixed. But still I hope that it is within the resources of dentistry to do something. But even if we do not succeed in that, I have the satisfaction of knowing that we have relieved the patient from a very terrible disease, which was steadily increasing, and which certainly must have destroyed his life if it had been left.

Now, a word about the epitheliomatous cases. I would remind you of the man whose photograph (Fig. 3) you see here, who has been in and out of the hospital a good many times. He was here first in September, 1894, and then you will notice that he had a tumor on the left side of his upper jaw, involving the malar region, and in no way infringing upon the alveolus. The alveolus, the mouth, and the palate were in all ways perfectly healthy, but there was a soft tumor involving the malar region. I was quite sure from the history,—for it was a very short history,—and the rapid growth, and the general appearance of the patient, that it was a case of epithelioma, and I attacked it externally by cutting directly into the growth, and by scooping out with gouges all the disease that I could find, and then I filled in the cavity with chloride of zinc paste. That is an exceedingly useful application in cases of epithelioma, because you get sloughs produced by the caustic paste, which come away some time afterwards, and in that way sometimes one is able to get rid of the disease, which you cannot reach with a knife. Accordingly, I did that for him, and he went out of the hospital fairly well. The only thing that went wrong was this : you notice how near the disease was to the orbit ; and the effect of the caustic paste was, as I had anticipated (for I told him he would most likely lose his eye), that the eyeball sloughed. That, however, is a very small matter comparatively. The eyeball having sloughed, I removed it, and the patient left the hospital in a fairly good condition. He was readmitted, however, in March, with a recurrence, and then I again scraped very freely and applied caustic paste the second time. Mr. Horsley did

another operation in April, and he was eventually discharged in May. Most of you have seen that man quite lately. He was in the hospital again in September, a year after the first operation, with again a small recurrence in the original site; and Mr. Horsley, who was on duty at the time, freely scraped and cauterized; and when I took charge again, at the beginning of October, the man was in a perfectly satisfactory condition so far as one could tell, and I again allowed him to go home; but I fear he will be back again before very many months are over, with a further recurrence of the disease.

That is the difference between the two classes of disease. In cases of sarcoma, if you thoroughly remove the growth you may hope, and with a reasonable chance of being gratified, that you will have no further trouble. But in epithelioma you may be sure of this, that, cut it away as freely as you like, you will be almost certain to have a recurrence. Again, the worst of epithelioma is that you have it spreading through all the cavities; I mean you have all the cavities of the face involved, and it may even eat into the cranium. However, it is not the only disease which may involve the cranium. Sarcoma may do that in rare cases, and I want to bring to your notice a case which was under my care some years ago, and the preparation from which is over the way in the museum. The history was briefly this: A girl came under my care in 1868, who had had a tumor removed by Sir William Fergusson from the inner angle of the orbit ten years before, and I have no doubt it was thoroughly done. This tumor began to grow again, and she went to Sir William Fergusson in 1866, and he then operated again; but in three months from the date of the operation the tumor returned in the old situation at the inner angle of the orbit. Then the eyeball became displaced, and in December, 1867, the sight was altogether lost, and the right eye became so painful that it was removed by the surgeon of Chatham Hospital in January, 1868. When she came under my care you can have an idea of the hideous nature of the case from the drawing shown. The tumor involved the whole of the right side of the face and the orbit. The girl was not in a condition to bear any operation, as she was evidently sinking rapidly from the disease, and she died at last with some epileptic convulsions. At the post-mortem examination we found the condition which is shown in that drawing,—viz., that the roof of the right orbit was entirely destroyed by the growth, and that the growth, as you see there, encroached upon the cranium, and produced pressure upon the brain and the epileptic convulsions from which she had suffered. I was extremely glad, of course, that I had not attempted any operation, for I certainly should



FIG. 3.—Epithelioma of the left malar and superior maxillary.



FIG. 4.—Recurrent ossifying enchondroma.

have killed the patient, if not on the table, very soon afterwards. That is the difficulty, of course, in some of these severe cases, that you are not quite sure what you will do at the operation. When I asked Mr. Godlee to see this man, he rather dissuaded me from operating. Subsequent events have shown that he was perfectly justified in his opinion. Fortunately, it turned out to be incorrect, and I was able to remove the tumor; but one never quite knows when one is embarking in these severe cases how they may terminate.

In addition to sarcoma and carcinoma, we have other tumors of the jaw which really are very little less malignant; and I show you here the photographs of a case which came under my care some years ago, a man with a very remarkable recurrent cartilaginous tumor of the upper jaw. Now, the history of this man is very remarkable, and, curiously enough, I had been a witness of some of the early proceedings in the case. He came under my care in 1868; and as long before as the year 1850, when he was a lad, he had had an operation performed upon him by Mr. Le Gros Clarke, at St. Thomas's Hospital. He had removed a small tumor, the nature of which we could not ascertain, but the tumor was a small one from the nasal process of the maxillary bone. In 1852, when I was a second-year student at King's College Hospital, I very well remember the boy being operated upon a second time by Mr. Partridge, and he then removed apparently the whole of the disease which had recurred in the same situation, and the patient made a good recovery, except that there was a little sinus left. Then he went on for some years, until about the year 1857, I believe, when he went to America, where he rapidly developed a tumor, which was removed in 1860 by Professor Gunn, of Ann Arbor, Michigan; then there was a recurrence; the man finally drifted back to this country, and he was brought again under my notice, when I persuaded him to go into the hospital and let me do something for him. His appearance, as you will see in this photograph (Fig. 4), was exceedingly hideous. The displacement of the eye was so remarkable that he was the great bugbear of the neighborhood where he lived, and they were only too glad to advise him to go into the hospital and have something done. I did there an operation very much of the same character as the one I have been describing. I need not trouble you, therefore, with the details. I laid open the face by a suitable incision, and I then, partly with my fingers and partly with instruments, managed to get away the great mass which you see there. Now, that case did perfectly well—just as our man in the ward has done—for a fortnight, and then he was so well that he asked the house surgeon if he could go out for a little

walk. The house surgeon of the day—I have forgotten now who it was—was not aware that there was a sharp east wind blowing, and he allowed the man to go out; and unfortunately, either from the east wind or from the general exposure, he got an attack of erysipelas complicated with pyæmia, from which he died three weeks after the operation, practically cured of the disease. The skull is over the way in the museum, and you can see it at any time in the collection there. That case proved to be one of ossifying enchondroma, and no doubt all the earlier tumors which were removed by the other surgeons were of the same nature. In certain portions of the cartilage ossification had taken place, and you could trace distinctly, both with the naked eye and also microscopically, the elements of bone interspersed in the cartilage. I very much regretted the unfortunate event, but I had hoped we should have had a complete cure; and I believe myself that, as we say, the man “died cured.” But, of course, in these recurrent cases, however careful you may be, there is always the danger that if the patient survives there may be an element of disease there still, which may spring up and reproduce itself.

TUBERCULOSIS OF THE HIP-JOINT.

**REPORT OF A VERBAL COMMUNICATION TO THE PATHOLOGICAL SOCIETY OF
PHILADELPHIA.**

BY JOHN ASHHURST, JR., M.D., LL.D.,

**Barton Professor of Surgery in the University of Pennsylvania; Surgeon to the
Pennsylvania Hospital and to the Children's Hospital, etc.; with pre-
sentations of specimens and drawings by JOSEPH P. TUNIS, A.B.,**

**M.D., Surgeon to the Dispensaries of the Methodist
Episcopal, the Children's, and the Presby-
terian Hospitals, etc.**

GENTLEMEN,—When your president asked me to make a few remarks this evening on some subject in surgical pathology, after consultation with Dr. Tunis, who kindly consented to assist me, we thought it might be of interest to bring forward the subject of tuberculosis of the hip-joint, although the society had had, not very long ago, a meeting principally devoted to the general subject of tuberculosis of the bones and articulations. In the remarks which I had the honor of making at that meeting, I dwelt more upon the general subject of osseous tuberculosis, and this evening I propose to confine myself to the disease as affecting the hip-joint, which has not always received the attention it deserves. In the first place, I think we may classify cases of hip-disease into three varieties, the rheumatic, the simple traumatic, and the tuberculous. The two first named are sometimes spoken of as cases of arthritic coxalgia, which is not really a good name to apply in this connection, because all forms of coxalgia which involve the joint tissues as distinct from the bone may properly be called arthritic. There is a not infrequent form of coxalgia, or hip-disease, which is really a rheumatic synovitis. We have in these cases a history of the child being exposed to cold or wet, sitting down on a cold stone or on the wet grass, for example, and oftentimes symptoms of hip-disease will thereafter develop. These patients improve under careful treatment, and the child is ultimately as well as before. These might properly be called cases of rheumatic synovitis of the hip-joint,

and the patient may be expected to recover as he would from a similar condition of any other part. Then there are cases in which, occasionally, a mild form of synovitis of the hip-joint seems to follow traumatism. These are not very common, because the hip-joint is so deeply placed as to escape in most instances, but we see cases in which children have met with doubtful injuries previous to the development of coxalgic symptoms. For instance, the parent thinks that the child may have fallen from its coach, or from a stool, to the ground, and while the history is very obscure, and while there are no external marks of injury, the child shortly develops symptoms pointing to hip-disease which last for a variable period, eventually passing off and the child getting well. It is possible that there may have been, in such cases, a simple synovitis, the result of contusion of the hip-joint, just as we may have a synovitis, the result of contusion of the knee. The large majority of cases of hip-disease, however, have as their essential lesion the existence of tuberculosis in some of the tissues about the joint, and superadded in many cases to the previous existence of the tubercle bacillus in some part of the body is a slight traumatism, which seems to determine the locality in which the disease shall be developed. Often the child may have had a number of slight falls, perhaps falls on the ice, or even in the house, and a child who is naturally awkward is, of course, more predisposed to fall than others. Again, boys, from the rougher plays in which they engage, fall more than girls, and we find that hip-disease is nearly twice as frequent in the male as in the female. Hip-disease follows these falls, but the child previously has had tuberculosis in some part of its body. Modern pathologists believe that the tubercle bacilli are very widely distributed, and may be stored up, as it were, in some part of the body, probably in the bronchial glands. As the result of traumatism, what the Germans call a place of less resistance is developed, and then the tuberculous action begins. Thus we have in the case of a tuberculous child the history of a fall or a succession of slight falls, which establish a place of less resistance in some of the tissues connected with the hip-joint. The tubercle establishes itself at that point and goes on to the production of hip-disease. The traumatisms concerned in the production of hip-disease are usually slight. A person who has received a severe injury of the hip may have a fracture or a dislocation, but is not apt to become the subject of hip-disease. It is from a succession of slight bruises rather than from any great violence that the condition is established which leads to this affection. The lesions of tuberculous hip-disease may begin in any one of the constituent parts of the joint.

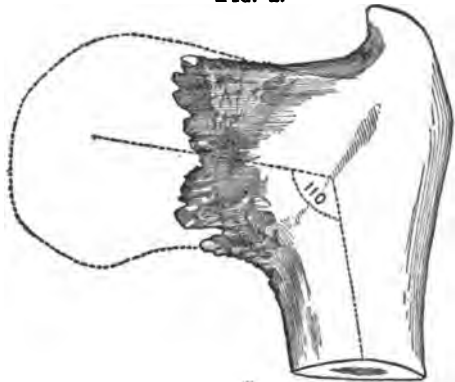
I do not believe that any portion of the joint is exempt in this respect. Tuberculosis may exist first in the head of the bone, constituting a form of hip-disease of which we have specimens here. (Figs. 1 and 2.) We have other cases in which the disease shows itself first in the neck of the bone (Fig. 3), the head being unaffected even at a very late period. The destruction of the neck sometimes leads to separation of the head (Fig. 4), which remains as a sequestrum in the articular cavity. Then there are other cases, though not very common, in which the disease begins in the acetabulum. A frequent classification of cases of hip-disease is into the arthritic (those affecting only the soft tissues), the femoral, and the acetabular, and attempts have been made to differ-

FIG. 1.



Complete loss of the head of the bone down to the anatomical neck. There is apparently no disease of the neck of the bone itself, and therefore no alteration in the normal angle between the neck and the shaft of the bone.

FIG. 2.



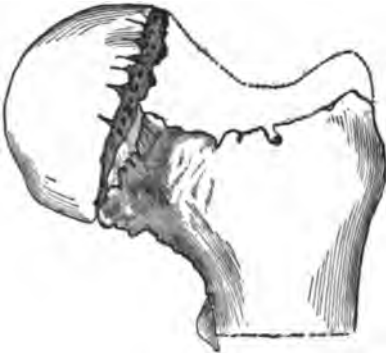
Complete loss of the head and extensive disease of the neck of the bone, associated with an alteration of the angle, reducing the latter to 110° . The dotted lines indicate the loss of substance, which has extended down below the surgical neck.

entiate between the latter by the position of the sinuses which form in the progress of the disease. In cases of femoral coxalgia the sinuses are on the outer portion of the limb, whereas in acetabular coxalgia they are on the inner side, while in cases in which the acetabulum has been perforated they may open in the groin above Poupart's ligament. These diagnostic marks, however, are not very satisfactory, because in advanced cases we usually have both parts involved. While I would not deny that the acetabulum may be primarily the seat of disease, it is certainly much less often so than the head or neck of the femur, as is shown by the fact that in most cases the acetabulum is only slightly implicated even when the femoral disease is far advanced. We may also have hip-disease arising in the soft tissues of the joint, not merely

in the mild forms of synovitis which get well under simple treatment, but we may have tubercle making its appearance first in some of the soft tissues, and especially, I believe, in the ligamentum teres. The points to which I wish particularly to invite the attention of the society to-night are the function of the ligamentum teres as explaining the circumstances under which it becomes involved in hip-disease,—and it is my belief that hip-disease begins here oftener than is usually supposed,—and the very marked changes observed in the head and neck of the femur, and the explanations which may reasonably be given as to their occurrence.

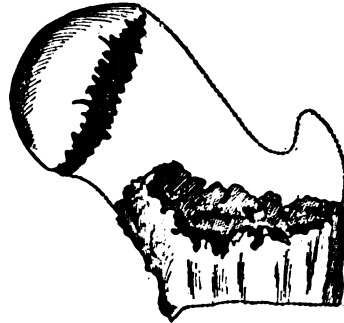
Taking up the bone changes first, we have in one case the head remaining and the neck partially absorbed, or perhaps disappearing

FIG. 3.



Results of rarefying osteitis, probably tubercular, affecting principally the neck of the bone. The head of the femur is shown to be for the most part free from disease, and only that portion in the neighborhood of the anatomical neck has been affected. Marked shortening has occurred in this case, and great loss of bone-tissue as the result of the continued suppuration. The head of the bone was found firmly fixed in the acetabulum, and was removed separately.

FIG. 4.



Extensive disease of the neck of the bone from the anatomical neck to the surgical neck of the femur. The dotted lines represent diagrammatically the amount of tissue lost.

completely, while in other cases we have the neck of the femur remaining though the head of the bone may be reduced to a mere

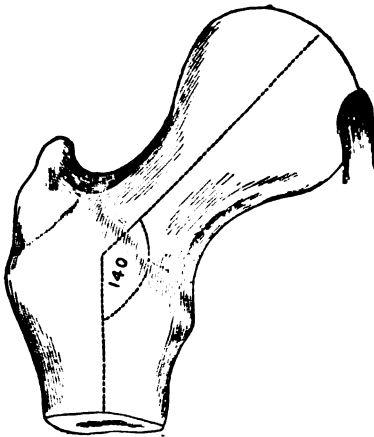
osseous button. The changes in the head of the bone may be due to several causes. Oftentimes tubercle is deposited in the first instance in the caput femoris, and it is easy to understand that with the extension of the disease the bone will become softened, and that portions may be thrown off into the joint as the result of the carious process, the head thus becoming gradually disintegrated. Then there is another cause to which attention has been called by Dr. Lovett, of Boston, who believes that the reason that the head of the bone disappears in some cases is its attrition against the acetabulum, gradually causing its

disintegration. Dr. Lovett advocates the treatment of hip-disease by powerful traction, or what he calls *distraction*, and he gives one illustration showing the upper end of the femur in a patient who had been thus treated, and a second representing the specimen from a case of about equal severity in which the patient had been treated without traction. In the first instance the head of the bone was but slightly worn away, while in the other case it had almost disappeared. I have no doubt that Dr. Lovett is correct in his views upon this subject. Then there are cases in which, the articular cartilage being separated, the bone is exposed to prolonged maceration in the purulent contents of the joint, and becomes roughened and finally disappears, to a certain extent, as a consequence of this maceration. We see the same thing in cases of empyema, where, the pus having been discharged through an incision, the rib sometimes becomes carious or necrosed by maceration, and partial disintegration follows. The same thing is seen in the secondary disease of the vertebræ which sometimes follows upon such an affection as perinephric abscess. The coexistence of vertebral caries and a lumbar abscess does not necessarily prove that the abscess is of spinal origin. We may have a perinephric abscess causing superficial caries of the vertebræ by prolonged contact of the bone with the pus of the abscess cavity, and similarly may have maceration of the head of the femur by pus in the hip-joint. The disappearance of the caput femoris in hip-disease may therefore be due to a combination of three causes: 1, the presence of tubercle; 2, the attrition of the head of the bone against the acetabulum; and, 3, the maceration of the bone in the purulent contents of the joint.

As regards the changes in the neck of the bone, we have a very interesting alteration in the shape of the neck and in the angle which it makes with the femur. This is very well shown in some of these specimens. The head of the bone in the normal position (Fig. 5) occupies a position considerably above the level of the trochanter, and the neck joins the shaft at an angle of about 140 degrees. This varies in the individual at different periods of life, but in the normal bone the neck always makes an obtuse angle with the shaft. Here is a specimen (Fig. 6) in which the disease appears to have affected principally the soft tissues, and yet there is a change in the bone, the neck being shortened and the angle of its attachment being reduced to about 130 degrees. In another specimen there has been extensive disease of the bone itself, and the head has separated from the neck, which occupies a position at right angles to the shaft. Here is another specimen (Fig. 2, *supra*) showing a case in which the head and neck of the bone

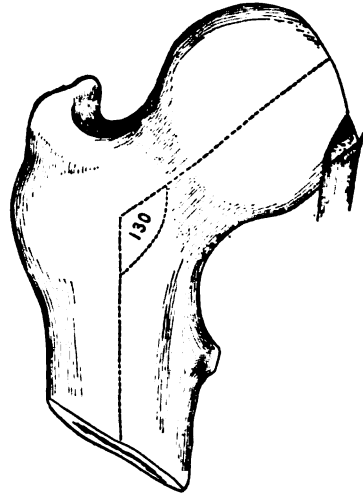
have almost entirely disappeared, but what is left of the neck occupies a position at right angles to the shaft. This change in the neck of the bone is very striking, and is due to a form of osteitis which is often spoken of as rarefying osteitis, but which is not necessarily a tuberculous lesion. It is met with very often as the result of ordinary traumatism. It is a change, too, that we are familiar with in old persons, and is usually spoken of as a senile change. It has been believed that old age of itself leads to this change in the angle of the bone, and its occurrence is given as one of the reasons why old persons are more subject than younger ones to fracture of this part. But Sir

FIG. 5.



A perfectly healthy femur-head, removed post mortem from a child in whose case the opposite caput femoris had been removed by excision six years previously, with marked improvement resulting. The angle of the neck with the shaft is shown to be about 140° . The ligamentum teres is represented in its normal position.

FIG. 6.



Marked shortening of the neck of the femur and decrease of the angle between the neck and the shaft. The angle is reduced in this specimen to 130° . The position of the ligamentum teres is well shown. The deformity has been the result of a rarefying osteitis of the neck of the femur. The head of the bone is not diseased.

George Humphry, of Cambridge, England, whom I regard as one of the very highest authorities on bone pathology, has contravened this view, and has established the fact that this change of angle is not properly a senile change, but that it is a pressure change. He maintains that the change is gradually brought about in the course of a long life by the weight of the body being sustained upon the necks of the femurs, thus gradually pressing down the heads of the bones. It is therefore the result of pressure from walking through a long period of years, and is not the result of age. Sir George Humphry has dem-

onstrated this by comparative observations in persons who had been subjected in early life to amputation of one of the lower limbs. In cases, for example, in which there had been an amputation of the right leg, so that it was necessarily relieved from the pressure caused by walking during the rest of the patient's life, the weight of the body being borne upon the left leg, he found that in the limb which had thus been relieved from pressure, although the person may have lived to extreme old age, the neck of the femur retained its normal angle, whereas in the limb which had been exposed to pressure, not having been amputated, and therefore continuing to sustain the weight of the body, the so-called senile change was thoroughly established and in some instances even more marked than usual. He has thus made it very clear that this change which is ordinarily observed in advancing years is not really dependent upon old age, but is simply a result of pressure. We may have a rarefying osteitis which by softening the bone hastens this change, and cases are on record in which this condition, ordinarily met with only in advancing years, has been produced in the course of a few months as the result of traumatism. There have been suits for malpractice under such circumstances, the accusation being made that the surgeon had not recognized a fracture of the neck of the bone, because when the patient was discharged from treatment the limb was found to be shortened. I believe it, however, to be a well-established fact that as the result of traumatism this condition of rarefying osteitis may occur, and the so-called senile change be brought about in a short time as the result of pressure upon the softened bone. The same thing takes place in these cases of hip-disease. The bone becomes softened from the presence of tubercle, and then the angle of the neck changes as the result of pressure through the child walking upon the limb. The change, therefore, results from pressure on the softened bone, and not necessarily from the presence of tubercle nor of osteitis, which would not produce the effect if pressure could be avoided. Clinically we find many cases in which this change has occurred. The neck of the bone, instead of occupying its normal position at an obtuse angle with the shaft, makes with the latter a right angle, or even an acute angle. This is the chief cause of the shortening in the advanced stages of hip-disease. It has been supposed that in these cases the head of the bone was dislocated, and in some cases dislocation actually occurs. I have found, in the operation of excision, the head of the bone resting on the ilium above the acetabulum. But in most cases where dislocation is supposed to have occurred there is really no displacement of the head, but the angle of

the neck of the bone is changed so that the trochanter slips as it were beyond the head, which still remains in its socket. This may occur in connection with caries, or with that condition which Sir James Paget calls interstitial absorption, where suppuration may be entirely absent. This interstitial absorption is frequently met with in the vertebræ, where it causes great deformity, and more rarely in the long bones. We have the same interstitial absorption occurring in hip-disease, and we see its effects in many cured cases, the patient getting well under careful treatment without any abscess forming, but with marked shortening due to the head and neck of the bone being partially absorbed, and to its angle being changed. In other cases, of course, abscesses form in connection with ordinary caries, which is very often tuberculous, though not necessarily. The head of the bone may then be separated, and may be found completely loose in the joint. Disease of the acetabulum is comparatively rare, and I do not know that I have ever in excising the hip-joint found the acetabulum extensively involved while the femur had escaped. It is, on the other hand, very common to find the femur extensively and the acetabulum only slightly diseased. It is usually involved to a slight extent, but only in advanced cases of hip-disease is it much affected. It is seldom involved to anything like the same degree that the femur is, and in the acetabulum necrosis often takes the place of caries.

Disease of the hip may also begin in the soft tissues of the joint, particularly, as I have already said, in the ligamentum teres. Most surgeons are, I think, under the impression that this ligament has no function, and this view is encouraged by the opinion of many anatomists who maintain that it is almost constantly in a state of relaxation. I cannot but believe, however, that the ligamentum teres really has an important function, and that it is in connection with this function that its liability to injury—and in consequence to become the seat of tubercle—occurs, just as we find, in other regions of the body, that parts which are functionally active are especially exposed to traumatism. The lower jaw, for example, is much more liable to fracture than the upper jaw, and the clavicle is much oftener injured than the scapula. Another common impression is that the ligamentum teres runs from about the centre of the acetabulum directly across the joint to the head of the femur, but this is not correct. The drawings which Dr. Tunis has had placed on the black-board, taken from Testut¹ (Figs. 9 and 10), illustrate what

¹ E. Testut, *Traité d'Anatomie*, tome i. pp. 435, 436. Deuxième édition. Paris, 1893.

is really the normal position of the ligamentum teres. You will observe that it is a wide band attached to the lower edge of the acetabulum, divided below into two branches, and passing up in contact with the femur to which it is joined at a depression in the head of the bone. You will notice that when the patient is erect it is almost a vertical ligament. Now, I believe, and I think that this view is sustained by the evidence derived from a study of hip-disease, that, as long since pointed out by Turner and Savory,¹ the ligamentum teres really has an important function, and may be properly described as a suspensory ligament of the trunk. Of course, the whole weight of the body is not sustained by this ligament, but mostly by the head of the femur in more or less close contact with the cotyloid cavity; but this ligament, I believe, serves to diminish the pressure of the pelvis upon the head of the bone, and to lessen strain. The position of the ligamentum teres is like that of the old-fashioned leather springs which used to be found in stage-coaches, the body of the coach being balanced upon two broad strong bands of leather. The pelvis is to a certain extent similarly balanced upon these ligaments on either side, which are attached to the heads of the thigh-bones, and then pass down to the lower edges of the cotyloid cavities. I believe that their function is to ease up as it were, and prevent sudden concussions, which would otherwise be experienced at every step that we take. If these ligaments were absent, the cases in which we have disease as the result of concussion or slight contusion of the hip-joint would be much more common than they are now. That the anatomical relations of the ligamentum teres are what I have described, is shown by these specimens in which a portion of the ligament is still attached. (Figs. 5 and 6.) Here is one where the neck of the bone is almost entirely gone while the head is hardly involved at all. The ligamentum teres is seen passing downward, hugging as it were the head of the bone, until it reaches its point of attachment at the lower part of the acetabulum. As a result of the stress put on the ligament in the various movements of the part it becomes weakened, and thus a place of less resistance; a deposit of tubercle follows; and the ligament, softened and partially disintegrated, ceases to protect the joint, the other constituents of which then suffer from the effects of concussion and other slight traumatisms, and in turn become tuberculous, the primary lesion of the ligamentum teres thus furnishing a prolific cause of hip-disease. The older writers maintained the importance of the ligamentum teres in

¹ Journal of Anatomy and Physiology, vol. viii.

the development of hip-disease, and I think with reason. I believe, then, that we may have tuberculosis affecting the head and neck of the femur primarily and the acetabulum secondarily, or, more rarely, the acetabulum primarily and the other parts secondarily. In other cases the disease affects first the soft tissues, and particularly the ligamentum teres. In some cases the neck of the bone is shortened and its angle changed, or it may be so much disintegrated that the head becomes separated while itself but little affected. In other cases the head of the bone may have almost disappeared, and what is left of it may yet be attached to a nearly unchanged neck. In still other cases, the disease beginning in the ligamentum teres, the soft tissues of the joint may be extensively diseased and the caput femoris deprived of its articular cartilage, while in other respects the bone is but little affected. (Figs. 7 and 8.)

FIG. 7.



Anterior aspect of the head of a femur in which the articular cartilage was principally involved. The neck of the bone has been shortened, and the angle of the neck with the shaft reduced to 128° . The peeling off of the articular cartilage of the head of the femur and the erosion of the cancellous bone are well shown.

FIG. 8.



Posterior aspect of the same bone. Change of angle to 128° , shortening of the neck, and necrosis of the articular cartilage are well shown. There is also a pocket of diseased bone at the anatomical neck of the femur.

Dr. Tunis has had drawings made from these specimens, illustrating the different points to which I have asked your attention, and these he will now present for your examination.

DESCRIPTION OF THE SPECIMENS.

BY JOSEPH P. TUNIS, M.D.

Before taking up in detail the interesting series of specimens which have been selected from a large number of femoral heads removed by excision at different times at the Children's Hospital, it may be well to review, briefly, some of the more important points of the anatomy of the hip-joint. (See Figs. 9 and 10.)

In addition to the muscles which surround and give support to the head of the femur at the point where it is received into the os innominatum, there are a number of ligaments peculiar to this joint,—namely, the ilio-femoral, the ligamentum teres, the cotyloid, and the transverse. The cotyloid ligament occupies the brim of the acetabulum and helps to deepen that cavity. A reference to the accompanying illustration (Fig. 10) will show the relative position of the component parts of this joint. We wish especially to call attention to the ligamentum teres.

In Morris's "Anatomy"¹ its origin and insertion are most carefully gone into, and six different plates used to illustrate the manner by which it may be put upon the stretch. "It is an intra-articular flat band which extends from the acetabular notch to the head of the femur, and is usually about an inch and a half long. It has two bony attachments, one on either side of the cotyloid notch immediately below the articular cartilage, while intermediate fibres spring from the under surface of the transverse ligament. The ischial portion is the stronger, and has several of its fibres arising outside of the cavity, below, and in connection with the transverse ligament where it is also continuous with the capsule and periosteum of the ischium. At the femur it is fixed to the front part of the depression on the head, and also to the cartilage round the margins of the depression."

"The ligamentum teres² is of but very little use in resisting violence or giving strength to the joint. It assists in checking rotation outward and abduction during flexion. A ligament can only be of use when it is tight, and it was found by trephining the bottom of the acetabulum, removing the fat, and threading a piece of whip-cord round the ligament, that the ligament was slack in simple flexion, and very slack in complete extension, but that its most slack condition was in abduction. It is tightest in flexion combined with abduction and

¹ Morris's Anatomy, p. 266, ed. 1893, P. Blakiston, Son & Co., Phila.

² Ibid., p. 270.

rotation outward, and almost as tight in flexion with outward rotation alone, and in flexion with abduction alone."

It is also of interest as bearing practically on the subject that the angle which is made by a line drawn through the axis of the neck meeting a line drawn through the axis of the shaft of a bone ranges between 110 and 140 degrees. It is a smaller angle in women and children, according to Quain's "Anatomy."¹

Although it is a commonly accepted idea that the ligamentum teres is an unimportant ligament at the hip joint, it seems more rational to believe that it is of considerable importance, especially when we consider its topographical anatomy. While it is usually believed that the ligamentum teres stretches from the cotyloid notch directly over to the head of the femur, such is not really the case, but the ligament, on the contrary, passes from the depression in the head of the femur to the lower border of the cotyloid notch, as is well shown in Fig. 10. In this way, instead of being an unimportant ligament the ligamentum teres plays an active part in the mechanism of the hip-joint, helping, as it were, to suspend the pelvis and the organs contained within and above that bony arch on a framework of which the shafts of the femurs act as the principal support.

Examining into the function of the ligamentum teres from this point of view, it would at once appear that it assists in preventing concussion at the joint, and helps to prevent the head of the bone being driven up into the acetabulum.

In an exhaustive article in G. Schwalbe's "Morphologische Arbeiten," Jena, 1893, Dr. E. Moser reviews the literature of the ligamentum teres briefly and thoroughly. In the bibliography fifty-eight references are given, and the article is illustrated with twenty-seven drawings, principally embryological.

In the specimens about to be described, the position of the ligamentum teres is well shown in Figs. 5 and 6. These specimens illustrate especially the favorite seats of tubercular disease, and, taken as they are from a large number of specimens, they may be regarded as fairly representative.

Gray² says, "The hip-joint is rarely the seat of acute synovitis from injury, on account of its deep position and its thick covering of soft parts. Acute inflammation may and does frequently occur as the

¹ Quain's Anatomy, Part I., vol. ii., 1890, p. 123. See also Humphry's Journal of Anatomy, vol. xxiii. p. 273; and W. Braune's monograph in German.

² Gray's Anatomy, p. 869, ed. 1893, Lea Brothers & Co., Philadelphia.

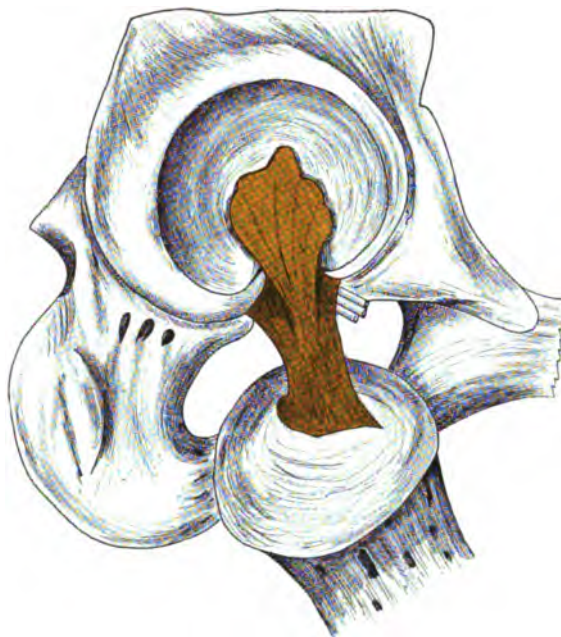


FIG. 9.—Origin and termination of ligamentum teres. (Poirier.)

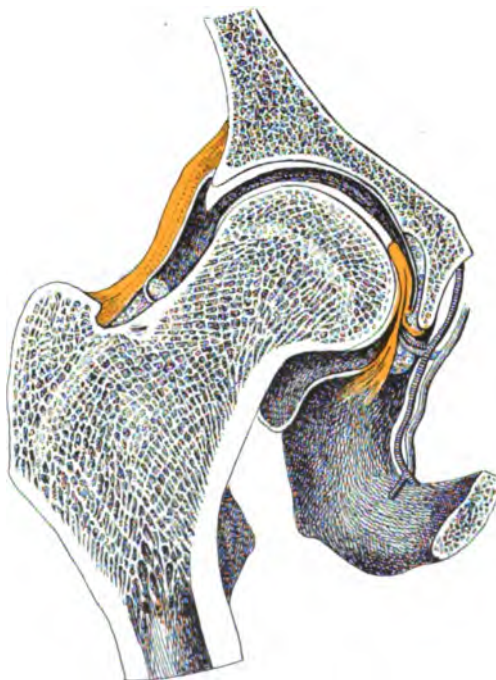


FIG. 10.—Position of ligamentum teres in erect posture.

result of constitutional conditions, such as rheumatism, pyæmia, etc. . . . Disease of the hip-joint is much more frequently of a chronic character, and is usually of a tubercular origin. It begins either in the bones or in the synovial membrane, more frequently in the former, and probably in most cases at the growing, highly vascular tissue in the neighborhood of the epiphyseal cartilage. In this respect it differs very materially from tubercular arthritis of the knee, where the disease usually commences in the synovial membrane.

An examination of Figs. 1, 2, 7, and 8 will show one of the most common seats of tubercular disease at the hip-joint,—namely, the head of the femur. This may or may not be associated with disease of the neck, as is shown in Fig. 1. Or, again, the disease may commence in the neck itself and not affect the head of the bone and the acetabulum, although the two conditions usually go hand in hand. This disease of the neck of the bone alone may go on to such an extent that a complete separation of the head from the shaft results. This is well shown in Figs. 3 and 4.

In excision of the head of the femur for this disease, an operation which is frequently practised at the Children's Hospital, it sometimes happens that the head of the bone with its articular cartilage remains in the acetabulum and requires the division of the ligamentum teres and some additional dissection before it can be removed.

Fig. 2 shows a case in which complete absorption and disappearance not only of the head but of the neck as well has resulted.

Shortening of the neck of the femur is a frequent result of tubercular disease. This is well shown in Figs. 3, 6, and 7, as the result of osteitis and necrosis of the bone. It is an almost invariable accompaniment of hip-joint disease, and gives rise at certain stages to the condition of inequality in the length of the two limbs, associated, as it is, with tilting of the pelvis and outward rotation of the head of the bone.

A change of the angle which the shaft makes with the neck of the femur frequently results. This is well shown in Figs. 6 and 7, and is a result of the extension of the tubercular process either up or down the shaft. Specimens 7 and 8 show how the normal angle of 140 degrees, which the neck makes with the shaft of a healthy femur (see Fig. 5), may be changed to an angle of 128 degrees, or even of 110 degrees (Fig. 2). This tubercular process is one of a rarefying osteitis, and is associated with the formation of pus, the discharge of bone-salts, and the accompanying tubercular bacilli.

In this connection it is interesting to record a typical case of cured

coxalgia, which has been under observation for the last nine months. The history of the case is as follows :

Edna K., aged nine years, with a negative family history, except that a maternal aunt died of consumption, had always enjoyed good health until the age of six, when she had scarlatina and diphtheria at the same time. This was followed by whooping-cough, and the child was so desperately ill that her life was despaired of. In February, 1895, her mother first noticed that she complained of pain in her left knee. It was variously accounted for by different physicians, to whom the child was taken, as growing-pains, rheumatism, and neuralgia. These pains continued, and in April she began to grow lame. She was then restless at night, and frequently cried out with pain in her sleep.

She was seen at the Children's Hospital dispensary on the 8th of April, 1895, and a diagnosis of incipient coxalgia made. She was advised complete rest in bed, with extension to the diseased leg, and she was accordingly admitted to the Methodist Episcopal Hospital on the 26th of April. There she remained in bed for four months, with sand-bags on either side of the left leg, and an extension of four pounds in weight. On her admission to the hospital she was in very poor physical condition and extremely pallid. During the four months she remained in bed her color was much improved, and her strength considerably increased. At the end of four months a plaster-of-Paris dressing was applied in place of the extension and rest in bed, and she was allowed to get about with a high shoe on the sound leg and crutches.

Condition of the Hip.—In April, 1895, it was impossible to make the slightest motion of the left hip without causing pain. Four months later there was slight pain on free motion, especially when the knee was flexed on the abdomen. In November, or eight months after treatment was begun, there was very slight fixation on extreme flexion, and no pain whatsoever. This is well shown in Fig. 11, in which the child may be seen standing on her right foot, with the left one elevated in such a way as to bring the knee on the affected side almost up to the abdominal wall. A fixation splint is to be made for this child, and she will be allowed to go about on crutches until all inflammatory symptoms have disappeared, for six months, when the cautious use of her limb will be allowed.

She is now in excellent general condition, has a good appetite, and is apparently but little inconvenienced by the treatment. No tonic has been necessary in these latter months, although an emulsion of cod-



FIG. 11.—A case of cured coxalgia, with the diseased limb in a position of flexion, nine months after treatment was begun.

liver oil was given her for the first few weeks of treatment. She is apparently on the road to perfect recovery, and her case seems to be one of those encouraging ones in which a cure of coxalgia is possible. It is probable that in her case the disease was arrested promptly by the treatment instituted, and, as there was no grave constitutional taint, the routine treatment has been successful. Time alone will decide whether the disease has been successfully arrested. If so, it is probable that the disease was limited to the articular cartilage of the head of the bone, and the inflammatory process arrested before the development of any rarefying osteitis.

We are indebted to Mr. Clifford B. Parker, a second-year student in the Medical Department of the University of Pennsylvania, for the excellent drawings from which Figs. 1 to 10, inclusive, were made.

CONCLUSIONS.

1. Tubercular disease of the hip-joint attacks either the head of the femur, the neck of that bone, or the soft tissues in the neighborhood of the articular cartilage, being especially liable to affect the ligamentum teres primarily. It rarely appears first in the acetabulum.

2. Rarefying osteitis of the neck of the femur soon leads to shortening of that portion of the bone.

3. Rarefying osteitis of the neck of the femur allows a change of angle, from pressure, of from 10 to 30 degrees, or even more.

4. The head of the femur may escape disease, and become detached from the shaft if the disease at the neck fail to be arrested.

A MODIFICATION OF WHITEHEAD'S OPERATION FOR THE REMOVAL OF THE TONGUE.

CLINICAL LECTURE DELIVERED AT THE UNIVERSITY COLLEGE OF MEDICINE.

BY HUNTER McGUIRE, M.D., LL.D.,

**Professor of Clinical Surgery in the University College of Medicine, Richmond,
Virginia.**

GENTLEMEN,—The first case I show you to-day is that of a woman aged fifty-five years, with an epithelioma upon the left side of the tongue, extending from near the tip to a point nearly opposite the anterior pillar of the fauces. So far as I can see there is no involvement of the lymphatic glands. The right side of the tongue is unaffected. The cancer made its appearance six or eight months ago, and has been treated by caustics and irritants of different kinds, and, of course, in this way its progress has been made more rapid. The patient has been kept in the hospital for a day or two, in order to get her mouth as clean as possible. Hydrate of chloral, two grains to the ounce, has been used as a wash. She has been directed to wash her mouth with this solution every half-hour while awake. Her teeth have been cleansed by a brush, and a mass of tartar and dirty stuff removed, which had been collecting there for some time, rendering the mouth very foul.

You see I have had the ends of the operating-table reversed, so that the woman's shoulders may lie upon that portion of it which can be elevated when a patient is put in Trendelenburg's position. In this way her shoulders are raised until her head is brought upon a level with the face of the operator. Straps are placed under the axillæ, and fastened to the top of the slab to keep her from slipping down upon the table. Chloroform is the anæsthetic used. The patient's mouth is kept open by a suitable gag. Her face is turned to the right side, and the cheek pulled away by a simple retractor. As she is under the influence of chloroform, I pass a needle, armed with a stout thread, through the end of the tongue, some little distance back from the tip, and now I am ready to begin the operation. With a narrow, straight

bistoury the tongue is split in the middle line, from near the glosso-epiglottic fold to its tip. I take great care to keep the knife in the middle line, and, as there is nothing there but capillary vessels, there is very little hemorrhage following this cut. The tongue is now pulled forward and the frænum freely divided, and by rapid strokes of the knife the left side of the tongue is separated from its attachments to the alveolus and the parts beneath the tongue until a point opposite the anterior pillar of the fauces is reached. The anterior pillar is now freely divided with the knife, and the tongue pulled as far forward as possible. You see that, in consequence of the free divisions I have made, the left half of the tongue almost protrudes from the mouth. So far there has been very little bleeding, not a vessel has been cut that requires the surgeon to stop and control the hemorrhage. A transverse cut is now made with the knife across the dorsum of the tongue well back of the disease, entirely through the mucous membrane, and carried around the side of the tongue. It is important in making this cut to go entirely through the mucous coat upon the back and side of the organ. A pair of forceps (see Fig. 1) is now used, which, you

FIG. 1.



Forceps for the control of the lingual artery in excision of the tongue.

will see, has the blades with their convex surface looking back towards the throat. The blades of the forceps are placed in the transverse groove just made, the handles are pressed upon, and the blades closed; as they close, they cut through the brittle tissue of the tongue, leaving in their grasp, when they are quite shut, the lingual artery and nerve only. These are cut through with the knife just in front of the forceps, and that half of the tongue removed. A ligature is now put around the vessels embraced in the forceps, and the lingual artery and nerve tied. On one occasion, in removing the tongue in this way, instead of using the forceps I transfixed the organ with a fine, strong silk ligature, and tied it off, biting through the friable tissue grasped

in the ligature, until nothing was left except the nerve, vein, and artery. The forceps, however, I have found to be a more rapid and easier means of preventing the hemorrhage. If it is necessary to remove the other side of the tongue, the same method can be resorted to. There is no necessity, however, for removing both sides of the tongue, unless both sides are diseased, as the anastomosis between the two sides of the tongue by the blood-vessels and lymphatics is slight, and if cancer of one side of the tongue extends to the neighboring structures, it follows the lymphatics down into the neck, and involves the lymphatic glands in that region. My experience shows me, too, that if you can leave a portion of the tongue, the individual can swallow and speak much better than if the whole of the organ is removed.

This operation, as I have just performed it, is a modification of Whitehead's method of removing the tongue, and the modification that I have suggested makes the operation comparatively bloodless. I think that surgeons generally agree that Whitehead's method for removing the tongue is, so far, the best that has been devised, and that there is no longer any necessity for ligation of the lingual in the neck, or the incision in the operation, as suggested by Kocher. I believe, also, that the operations of Roux, Sédillot, and Syme need no longer be practised.

The chloral wash is continued after the operation every half-hour during the day, and several times during the night. If the mouth is not kept clean in this way, the nurse is directed to flush it out with a syringe. No drainage-tubes are used, and no packing the wound with gauze is resorted to.

CASES OF STRANGULATED HERNIA WHERE THE INTESTINE IS ALREADY GANGRENOUS AT THE TIME OF OPERATION .

ABSTRACT OF A PAPER READ BEFORE THE ÆSCULAPIAN SOCIETY OF LONDON.

BY STEPHEN PAGET, M.D., F.R.C.S. (Eng.),

Surgeon to the West London Hospital, and the Metropolitan Hospital London,
England.

GENTLEMEN,—I have put together all the cases of strangulated hernia that have come under my care in which the bowel was already gangrenous or gave way during the operation for its relief. I have put aside all the ordinary cases of strangulated hernia ; and I am compelled, therefore, to lay before you a terrible list of the worst and most distressing cases that fall to the lot of a hospital surgeon.

I have had no less than twelve of these frightful cases. Four were inguinal, four umbilical, three femoral, and one in the left abdominal wall. I have included among the twelve one very curious case, where the bowel gave way not at the seat of strangulation, but far away from the strangulated loop, along a remote loop which was bound together by old adhesions. This case ought, perhaps, to be excluded, but I have put it with the rest on account of its general likeness to them.

One patient, out of the twelve, died during the operation. No less than five patients died a few hours after it. Two patients died on the second day ; one on the third ; one patient, aged seventy-one, lived ten days ; one, an infant, lived for five weeks ; one recovered.

You will agree with me that this is a most frightful set of cases ; nor should I have ventured to bring them before you if I myself were to blame, and not others.

Let me give you the history of some of these. One of them, a woman seventy-five years old, had been treated at home for three days for a strangulated femoral hernia. She was admitted in a fearful condition ; the very sac was gangrenous, full of fæces and gas ; the bowel was gangrenous, and had a large hole in it. Another patient,

aged fifty-five, had been seized with strangulation of a large umbilical hernia on December 23, but she was not sent to the hospital till December 28. She was desperately ill, and in constant pain, temperature 103° F., face pinched and gray, fæcal vomiting; in the sac were a large mass of sloughing omentum and nearly a foot of gangrenous bowel. A third patient, aged seventy-one, had suffered a whole week; she had a large umbilical hernia, containing blackish fluid, sloughing omentum, and a large coil of gangrenous bowel. A fourth, aged fifty-five, had been treated from Tuesday to Saturday, for strangulated umbilical hernia, with an ice-bag. She had been constantly vomiting and had passed nothing; the sac contained a quantity of sloughing omentum, and half a foot of gangrenous bowel.

The responsibility for such deaths as these is often laid on the hospital. The friends of the patient say, "We took him to the hospital, and the doctor there operated on him immediately, without waiting to see if he was strong enough to bear the operation." In such cases the hospital surgeon is tempted to speak his mind; as in the case of an old man, lately under my care for strangulated hernia, who had been treated at home by two medical men with heroic doses of castor oil. He therefore was in danger of his life for many days after the operation; but at last he recovered. But the four patients of whom I have just spoken all died; and the responsibility rests, not with the surgeon who finally operated, but with those who spent days over methods of treatment worse than useless.

But in some of my cases the patient alone was to blame. For example, a woman, aged seventy-one, was admitted under my care, not long ago, already dying. For eight days she had been suffering from strangulated femoral hernia, but had got about without much pain or sickness, and had not sought advice till the evening before admission, when she suddenly developed a condition of collapse. On admission, the parts were so gangrenous that the landmarks were obliterated, and it was impossible to define the sac. In another case, a woman, aged forty-five, went from Tuesday to Friday with a strangulated femoral hernia without seeking advice; and at the operation I found that the bowel had already given way. And it would be easy, among my other cases of strangulated hernia, to find additional instances of this strange indifference of patients to their own pain and danger.

In addition to the patient's dread of an operation, and the delay caused by wrong treatment, there are three other reasons why the operation in cases of strangulated hernia is so often put off till it is too late to save the patient's life.

1. The patient may have had many previous attacks of incarceration or partial strangulation of the bowel, and the fatal acute strangulation may be at first just like one of these old attacks. In one of the cases of gangrenous umbilical hernia the patient, aged seventy-one, had a hernia of forty years' duration, and she had suffered repeated attacks of pain, constipation, and even vomiting. Her medical man wrote regarding this case, "She had the signs simply of incarceration for a few days. That is to say, there was but little abdominal distention; she passed flatus occasionally, and some little *fæces* came away with the enemata. During the last twenty-four hours I saw her, the symptoms had all become accentuated." But on operating I found the sac full of offensive blackish fluid, sloughing omentum, and a large coil of gangrenous bowel.

2. The strangulation, though acute, may be quite painless; and thus the hernia may be thought not to be strangulated, or may even be overlooked altogether. One of my patients, aged twenty-five, walked into the hospital looking well, and not complaining of any pain; but the bowel was already perforated. Another patient, aged forty-five, had a femoral hernia, strangulated from Tuesday to Friday; yet when she came to the hospital she did not mention that she had a hernia, and it was even thought at first that she might be suffering from typhoid fever; nevertheless, we found the bowel already perforated.

3. The hernia may have been partially reduced by taxis, with temporary relief of the patient's symptoms. Thus, in one of my cases, a young man with inguinal hernia,—strangulated for two days,—a partial reduction was made, directly after admission, by one of the resident medical officers; and this so reduced the swelling that, with more zeal than discretion, he punctured the rest of it. Happily, he only drew off some of the fluid in the sac. I operated a few hours later, and found a large coil of gangrenous bowel.

There are, therefore, at least five reasons why operation in cases of strangulated hernia is so often postponed till the patient is nearly or altogether past recovery. The patient may be ignorant that he is in urgent need of operation, or may refuse to allow it. His medical attendant may fail to urge it upon him, or may waste time with opium and external applications. The hernia, though acutely strangulated, may not give rise to pain. The final attack of strangulation may at first be like many previous attacks of incarceration or partial strangulation. The taxis may effect partial reduction, and the temporary relief thus given may be misinterpreted.

Thus far, gentlemen, I have been putting the blame on others, and not on myself. Let me now speak of one of these cases in which I must put the blame on myself, that the operation was deferred for twenty-four hours after admission to the hospital. The case was an instance of that rare form of hernia which we call "ventral hernia," where the bowel protrudes, not through any one of the usual openings, but through an opening in some other region of the anterior abdominal wall. The cause of a hernia thus abnormally placed is probably some strain or partial rupture of the muscles of this region, whereby the abdominal wall is weakened and predisposed to the formation of a hernia. In the case of which I am now speaking the strain had probably occurred during the pains of a difficult labor. The patient, aged forty-eight, had a hernia in the left half of the abdominal wall, away from the usual sites of hernia, about midway between the umbilicus and the anterior superior spine of the ilium. This hernia became strangulated, and she was admitted under my care. Several of my colleagues saw the case, and we thought that the swelling was probably an intra-abdominal new growth, pressing or dragging on the bowel and thus causing obstruction. Because of this mistake in diagnosis, and because her symptoms appeared to be less urgent than they were the day before admission, I delayed operation for twenty-four hours; then, on making a median incision, we found that we had to deal with a strangulated ventral hernia. Pus and lymph were already effused into the peritoneal cavity; and the bowel was so badly injured that it gave way just after it had been drawn back out of the sac.

We do sometimes in practice meet with cases of strangulated hernia where we are tempted not to operate immediately; but in every case, and at all risks, we must withstand the temptation. A neat, accurate, and complete division of the structure; a vigilant care to be very gentle in handling the bruised and softened bowel; obedience to the rule that if we are at all doubtful as to the condition of the bowel we should gently draw it forward and examine the points of constriction,—these precautions must be carefully observed. The skin-incision must be made very freely; the tissues over the sac must be gently handled. The surgeon must thoroughly expose and define the neck of the sac; he must lay open the sac very freely, from top to bottom (save in some cases of umbilical hernia), and he must know exactly where the stricture is, and ought to touch it, or better still to see it, before beginning to divide it. He must pass a probe through it first, and not pass the director till he has learned all he can with the probe;

nor must he attempt to pass his finger as a director through the stricture till he has at least eased it by dividing it first on the director. He must keep the edge of his knife at right angles to the edge of the stricture; he must remember that some strictures are deeper or broader than others. And if he is doubtful as to the state of the bowel, he must very gently and very slowly draw the bowel down, and make a careful examination of it.

Finally, if the bowel be gangrenous, or if it give way during the operation, what is the best method to follow? It is certain that the formation of an artificial anus is justified in those cases alone where the condition of the patient, or the extent of the gangrene, or the disposition of the contents of the sac, prevents resection of the bowel, with suture or with the use of some instrument, such as Murphy's button or Allingham's bobbin. Unhappily, the state of these patients on admission is sometimes so desperate that even the best method is useless. Of my twelve cases, one died during the operation, and no less than five died a few hours after it. It can make no difference, in such cases as these, whether the surgeon opens the bowel or resects and sutures it. Again, in four of the cases, it was the large intestine that was strangulated and embedded in a mass of adherent gangrenous omentum.

I hope that my account of these cases, the worst that fall to the lot of a surgeon, may at least enforce one unalterable rule of surgery,—never to waste a single hour in a case of strangulated hernia. Operate, in every case, at once; it is worse than useless to delay.

THE MODERN TREATMENT OF URETHRAL STRICTURE, AND THE AUTHOR'S SELF-INDICATING, BULBOUS, ASEPTIC URETHROTOME.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POLYCLINIC.

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GENTLEMEN,—I shall endeavor to give you as practical a consideration of the subject of the treatment of *urethral stricture* as an assembly of general practitioners has a right to expect. In conformity with this promise, I shall avoid as much as possible all scientific discussion that is not strictly necessary to the comprehension of the matter.

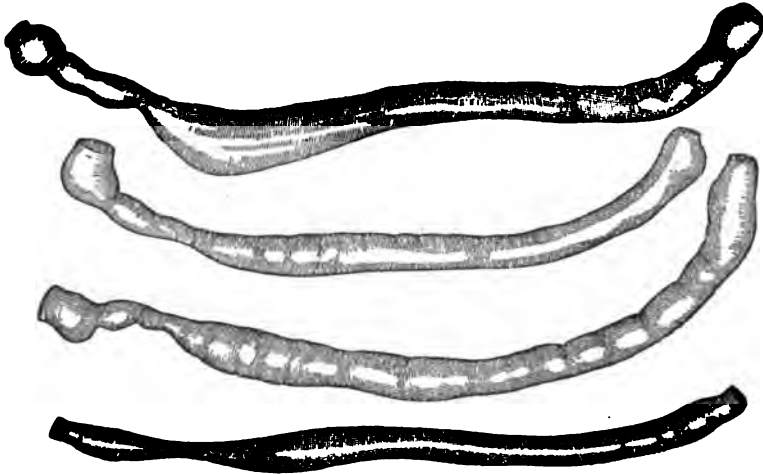
Let us first ask the question, What is a stricture? Various definitions have been given to this term, none of which could be declared to be strictly accurate. The difficulty of giving a correct definition lies in the fact that a uniform and unvarying calibre does not exist as far as the human urethra is concerned. The calibre of the normal urethra is varying, as the diagrams here presented show, which are taken from paraffine casts of the urethra in the cadaver (see Fig. 1). The definition of a stricture, therefore, must be a lax one, certain calibres in one urethra being normal which in another urethra would constitute a stricture. But calibre alone is not the most essential criterion of stricture. The presence of scar-tissue, however, is. Noticeable *cicatricial* constriction of the urethral cylinder, involving all its several constituent layers and forming an impediment to the normal energy of expulsion manifested during micturition, would constitute a true stricture. Inflammatory intumescence of the mucous and submucous layers of the urethra, though encroaching upon its calibre, but lacking the character of *organized and permanent scar-tissue*, does not constitute *organio stricture*.

Of the results of stricture let me mention two groups: first, the

immediate, resulting in an undue prolongation of the act of micturition; second, the remote and secondary, which are much more serious.

As alluded to before, in the presence of a stricture we observe a phenomenon similar to that noticed in stenosis of the valves of the

FIG. 1.



Paraffine casts of the normal urethra.

heart. To accomplish certain work a greater expenditure of muscular energy has to be employed. As a direct result of this, muscular hypertrophy follows, which after a sufficient lapse of time develops into a state of fatty degeneration and fibrous contraction, the final result of which is a contracted bladder. The direct result of this process is frequent and more and more difficult micturition; finally, a backing up of the column of urine, leading to dilatation of the membranous portion of the urethra, to contraction of the bladder, to dilatation of the ureters, and finally of the pelves of the kidneys.

From this brief survey you will see that the presence of a stricture is not only an inconvenience, but a constant menace to the integrity of the body.

As to the causation, we may divide strictures in two groups,—the traumatic and the gonorrhœal.

Traumatic stricture is the result of a partial or complete severing of the urethra by external or other violence. As the depth of the cicatrix generally includes all the layers of the urethra, it is rather massive, and, especially when circular, is apt to produce a very tight

and dense stricture, not amenable to palliative treatment by blunt dilatation. It is usually situated in the posterior part of the urethra, lying under the arch of the pubis, and a safe division can be attempted only by external urethrotomy, which, on account of the slightly diminished tendency to recontraction, must be supplemented by perineal dilatation.

To effect a real and lasting cure of a traumatic stricture a plan has to be adopted which has yielded lately excellent results in the hands of a number of surgeons. The treatment referred to is *excision of the cicatrix and suture of the mucous membrane and the other components of the urethra*.

The other, infinitely more numerous class of strictures, is the expression of a prolonged process of gonorrhœal inflammation. To provide for our treatment a rational basis it is necessary to comprehend the details of the manner of causation of gonorrhœal stricture. First of all, let me mention that the ancient view that gleet is the consequence of the presence of a stricture has been entirely abandoned by modern pathologists. The labors of Finger and others have put it beyond any doubt that the causal relation is the reverse of what Otis has taught. Gleet, or a chronic discharge of varying intensity, is the direct expression of the presence of a chronic gonorrhœal urethritis, which in the endoscopic field of vision is recognized as the *granular* form of urethritis. The cause of granular urethritis is an infection of the submucous connective tissue, very frequently extending into the erectile body of the urethra, leading to the deposition of varying masses of granulation-tissue, which in the course of the natural development of granulation-tissue ultimately becomes fibrillated connective or cicatricial tissue, the uniform tendency of which is contraction and shrinkage. According to the linear extent, depth, and general configuration of this cicatricial tissue the tendency to shrinkage will be lesser or greater, and the density, rigidity, or resiliency of this cicatricial ring will also be variable. Let us repeat, then, that stricture is not the cause of gleet, but the consequence of a chronic gonorrhœal urethritis, with or without noticeable gleet.

Another important point in the natural history of the formation of gonorrhœal stricture is the fact that a perfect evacuation and drainage of that portion of the urethra which lies behind the stricture is never possible; hence urine, shreds of mucus, pus, and, finally, of *débris* composed of all these substances will be retained, and will keep up a continuous culture of the noxious micro-organisms. I say "micro-organisms," as it is important to remember that a chronic urethral

process is rarely, if ever, caused by the presence of Neisser's gonococcus alone. The infection is rather a mixed one, other micro-organisms, staphylo- and streptococci of a more or less morbid, some of an indifferent, character, being all represented along with the diplococcus of Neisser, as was amply demonstrated by the labors of Lustgarten and Mannaberg.

Another point of importance must not be forgotten, and that is that as stricture hinders evacuation, so it is also a serious impediment to medication from the outside. Thus we see that a chronic granular process which was first established in the navicular fossa, and has led to a stricture, gradually creeps farther and farther back, leaving permanent vestiges of its destructive work along the entire pendulous portion, in the bulb, and finally the membranous, and even the prostatic portion. Sometimes it can be said, and in perfect conformity with the truth, that the entire urethra represents one continuous stricture. Furthermore, the peculiar tissue disease and change produced by the immigration of the gonococcus, though usually confined to the urethra proper, occasionally transcends these limits, involving the corpora cavernosa, the scrotum, perineum, and anal region to a most remarkable extent. This latter callous infiltration is most pronounced where multiple, scrotal, perineal, and circum-anal fistulæ communicating with the urethra back of the stricture have been established, washing and inundating an increasing area of tissue with alkaline urine, itself a potent irritant.

During the early stages of a granular urethritis the newly-formed deposit of granulation-tissue is necessarily very vascular. On a transverse section it is found to be supplied with a rich net-work of capillary vessels. The mucous membrane covering such a deposit is in a state of intense congestion, shedding the superficial layers of epithelium, all of which, under the microscope, show a distinct departure from the normal. In the endoscope such a patch of gonorrhœal urethritis appears to be velvety, intensely congested, the tissues rigid, and bleeding on the slightest touch. As the transformation into cicatricial tissue progresses the urethral scar becomes less and less vascular, and finally anæmic. In the endoscopic field of vision the presence of this stage can be ascertained by the absence of the normal finely-folded, star-shaped arrangement of the mucous membrane, and by a very striking phenomenon, due to the ready expulsion of all blood from the mucous and submucous layers of the urethra by the distending pressure of the endoscope. The moment, the proximal end of the endoscope being withdrawn, the strictured portion escapes the

distending pressure of the instrument, the field of vision, formerly white, almost chalky pale, becomes suddenly flushed by the inrush of blood. It is very interesting to observe the varying shape, reticulation, and irregular distribution of cicatricial matter in a urethra long

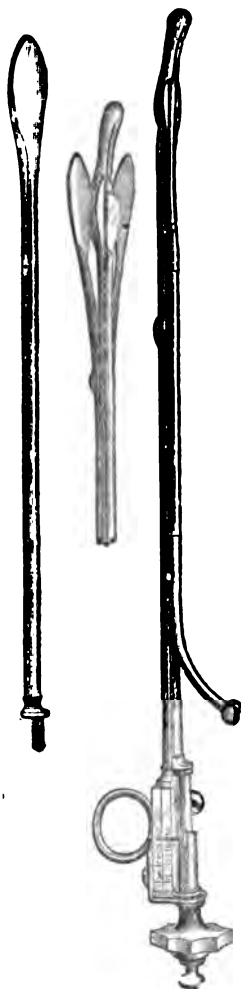
the seat of gonorrhœal inflammation. Before the introduction of the endoscope the precise and scientific diagnosis of the distribution of the gonorrhœal process in the urethra could not be arrived at. Local treatment was then in the nature of a wholesale procedure, the entire urethra being subjected to medication. How unsatisfactory the results of this old-fashioned treatment of gleet were all of you are sufficiently familiar with.

The location of a circular stricture, whether permanent or transient, can be diagnosed by means of bulbous instruments,—bougies,—which are arrested in passing through a stricture in both directions. We can use either a set of solid instruments, comprising a series of varying calibres, or we can employ one or another of the newer apparatus invented by Otis, Stewart of Pittsburg, or myself, consisting of a dilatable bulb placed at one end of a staff, at the other end of which is a dial indicating the amount of distention maintained by the bulb. These instruments are called *urethrometers*.

In taking charge of a case of chronic urethritis our first duty is to locate the exact place of the morbid process. For this the endoscope is the proper instrument. The endoscope, however, is valuable not only on account of its diagnostic properties, but is also useful as a means of a precise and rational local treatment applied to the seat of the trouble, and to no other place. Among the various chemicals

recommended for the treatment of this form of urethritis I have found mild or strong solutions of nitrate of silver, varying between five per cent. and ten per cent., the most valuable. The caustic-holder of steel wire is armed with a tuft of absorbent cotton, by means of which a precise application can be made to any desired spot. Another

FIG. 2.



valuable means of remedying a recent deposition of granulation-tissue is mechanical pressure, exerted by a steel bougie and augmented by gentle massage over the bougie. To be successful, however, this treatment presupposes a complete eradication of the specific coccus, for which repeated applications of nitrate of silver are indispensable. These early vascular and elastic coarctations in the submucous layers of the urethra are those which were designated by Otis as "strictures of large calibre," and were generally cured by free division and subsequent forcible dilatation. I have repeatedly tested the fact, by careful and long-continued endoscopic observation, that a recent inflammatory narrowing of the urethra, due to a vascular deposit, was seen to shrink rapidly after scarification either with a urethrotome or with a tenotomy knife, followed by mechanical pressure exerted with a steel sound. Though it is rarely necessary to perform urethrotomy in these cases, it cannot be denied that cure is considerably hastened by a complete division of the tissues involved, and upon this fact may be based the explanation of the remarkable successes of Otis.

Entirely different are the results in cases where the organization of the deposited granulation-tissue into fibrillar connective tissue is completed. No lasting cure or freedom from the tendency to recurrence can be vouchsafed here, whether the treatment be by gradual dilatation, by divulsion, or by urethrotomy.

Necessarily, a new cicatricial deposit will be interposed in the gap caused by the urethrotomy, and, left to itself, the process will irresistibly tend to recontraction. The opinion here expressed is based on a wide and long personal experience, and can be condensed briefly into this: that where a circular and cicatricial stricture, involving all the components of the male urethra, has been established, whether through a traumatism or through a gonorrhœal process, a complete, lasting, and radical cure cannot be accomplished by any of the known methods of surgical treatment short of excision and suture. On the other hand, it must be said that a vast proportion of cases of granular urethritis tending to the formation of permanent stricture can be managed successfully, and in a manner to eliminate the morbid process, and thus to prevent the formation of permanent damage to the urethra. Whether this is accomplished by methods of local treatment, attended with free hemorrhage or an absence of hemorrhage, depends upon the case, and must be determined by experience.

I should fail to state the whole truth, however, if I did not add the fact that a certain, fortunately small, proportion of all cases of gonorrhœal urethritis is intractable,—that is, will tend irresistibly to the

completion of the fatal circle, ending in the formation of permanent stricture. No form of local or general treatment, chemical or mechanical, avails in these cases, which represent the true *crux chirurgorum*; intentionally I do not say "opprobrium," as this peculiarity of certain individuals, mostly of the lymphatic, anæmic, and scrofulous habit, cannot fairly be charged upon the medical fraternity.

Let us consider now an extreme case, in which the welfare of a human being depends upon the correct understanding and prompt action of the medical man in charge. Let us assume that we have to deal with a so-called "impermeable stricture" of the membranous portion of the urethra. Up to within a day or two micturition was difficult, necessarily prolonged, very frequent, but still possible. Since a copious indulgence in alcohol, or after a sexual excess, a sudden, almost complete obstruction to the passage of urine has appeared. Dribblets or a continuous series of drops still escape, but do not carry away as much water from the bladder as descends from the kidneys. Extremely painful and dangerous cystic distention results, and, unless relief is afforded, may lead the patient to the fate of the famous astronomer and Danish bishop, Tycho Brahe, who died of rupture of the bladder.

Our first endeavor here should be to evacuate the bladder by the passage of a catheter; should this not be successful, even the passage of a filiform bougie will afford some relief. Should this succeed, it is wise not to withdraw the instrument for the sake of trying to pass a larger one, as we may fail to do again what we succeeded in doing once. It is better to tie in the filiform bougie, and leave it *in situ* for twelve hours. Just as much or more water will pass alongside of this instrument as before, and in increasing quantities. Should the patient's distress, however, be very great, it will be better to tap the bladder above the pubes by means of an aspirating needle. After the lapse of ten or twelve hours the irregular channel of the strictured place will have been smoothed out, as it were, by the pressure of the bougie, and the local congestion will have diminished to such an extent that instantly after the withdrawal of the filiform bougie a larger instrument can be passed in without serious difficulty. No trouble is experienced after this in dilating the stricture sufficiently, and maintaining this dilatation. Should we fail in passing the stricture, the dangers of retention remaining unrelieved, evacuation of the bladder will have to be accomplished by aspiration above the symphysis pubis. Thus time will be gained, and, as I have frequently observed, the congestion of the strictured place having been considerably relieved, mic-

turition will improve and the passage of an instrument will become possible. Puncture may be safely repeated five or six times, and if the consumption of fluids is kept down, the intervals may be considerably prolonged.

It will occur that, all of these expedients having been exhausted, the stricture remains impassable, and, serious cystic disturbances arising, instant and radical relief becomes imperative. Under these circumstances, one of the most difficult feats of operative surgery confronts the medical attendant, consisting in *external urethrotomy without a guide*. We read in older text-books long accounts of the absolute failure of very eminent surgeons, including the rejuvenator of external urethrotomy, Syme himself,—failures of finishing this operation. The cause of the trouble here was the fact that the operator, having passed a sound down to the stricture, could not detach himself frankly from the guidance of this instrument; but, having cut down upon its point, endeavored to locate the strictured channel in the narrow and bleeding field of operation, where the denuded urethral walls could hardly be distinguished from freshly-cut cicatricial tissue.

In those cases in which the expedient of driving a few drops of urine by external pressure exerted upon the bladder by an assistant through the constriction was successful, a guide existed for further efforts of the surgeon. Where, however, this failed, the plight of the operator was sorry indeed.

Petit, a French surgeon, has proposed at least, and Cocks, an Englishman, has successfully carried into practice, a method which is based on correct principles, and has been employed by him and many others, including myself, a great number of times with perfect and unvarying success. It is a constant observation that the deepest part of the urethra lying behind the stricture is considerably dilated, this dilatation being proportional to the duration and tightness of the stricture. In one of my own cases the diameter of this retro-strictural part of the urethra when empty was three-quarters of an inch by actual measurement. This dilated pouch, being practically a direct extension of the hollow of the bladder, and lying just in front of the prostate, can be easily punctured if its situation is thoroughly understood by the surgeon. The left index finger, having been introduced into the rectum, is pressed up against the prostate, the exact location of which being thus marked, a narrow knife is introduced just above the anus, clearing the sphincter, and is passed directly towards the space located just above the left index finger. The object sought for, being of considerable size, cannot easily be missed, and a gush of urine escaping along-

side of the blade informs the operator of the success of his procedure. Care must be exercised now not to withdraw the knife until the grooved director has been placed securely down and beyond its point; whereupon the knife can be removed, dilating the wound in its entire extent in an upward direction along the median line. After this the procedure is identical with the operation performed with the aid of a guide.

Although Otis has recommended and frequently practised internal urethrotomy of strictures of the *membranous* portion, yet a sufficient number of extremely annoying and dangerous cases of hemorrhage following this operation has been observed to prevent the general adoption of the practice. It is a safe rule, now universally accepted, that whenever a stricture is situated behind the triangular ligament *internal urethrotomy must be preceded by external urethrotomy*, and it has become my unvarying practice, whether the stricture be permeable or not, to drain the bladder first by external urethrotomy before strictures situated behind the bulbous portion are divided. Permanent drainage of the bladder and the possibility of its local treatment by irrigation are thus secured, and where hemorrhage is serious, pressure can be safely and permanently exerted upon those parts lying in front of the opening in the membranous portion. Assuming that the guide, however slender, has passed the stricture, external urethrotomy can be undertaken with great confidence of success. Even so, however, the operation should not be slighted, as various difficulties and complications may arise, putting its success in jeopardy, leading occasionally even to the death of the patient. The greatest danger to be overcome is the injury to the vascular mass of the bulb of the urethra, consisting of erectile tissue supplied by the bulbar artery. Injury of this plexus is always accompanied by considerable hemorrhage, which cannot be controlled by ligature, and sometimes even not by pressure. A case of death has occurred within my own personal knowledge, at Mt. Sinai Hospital, due to prolonged and uncontrollable hemorrhage following immediately upon an injury of the bulb.

If the following rule, insisted upon by me, is observed, this accident can be safely avoided, and then the operation is remarkably free from hemorrhage. Remember, then, please, that as soon as the skin, fascia, and perineal muscles are divided the bluish and elastic body of the bulb will appear in the bottom of the wound, just above the sphincter ani, and about one-half to one inch from it. This space corresponds to the membranous portion of the urethra, and in this space the urethra must be opened. To give more scope to the surgeon's work the bulb

can be raised out of the field of operation by means of a blunt hook. Thrust into the bottom of the wound, the surgeon's finger can easily feel the guide. As soon as the urethra is open a probe is passed into and through it into the bladder. The knife is withdrawn, and the grooved director is passed down the probe, which is withdrawn, to be followed by the introduction of a closed dressing-forceps. When this is withdrawn, with its branches held open, the innermost portion of the urethra is sufficiently dilated to introduce a soft catheter, by means of which the bladder can be thoroughly irrigated with boracic-acid solution or any other suitable antiseptic.

I may interpose here my insistence upon the necessity of careful antiseptics in all procedures about the urinary apparatus, carried as far as circumstances will permit. Often, as a matter of course, the bladder cannot be disinfected until access is gained to it by operation, but as soon as the bladder is entered its disinfection should immediately follow. Preceding any instrumentation, the urethra likewise should be irrigated as far as accessible.

Assuming that external urethrotomy and drainage of the bladder have been successfully accomplished, one or more strictures lying in front of this aperture have to be cut. To Otis belongs the undeniable merit of having shaped a formerly hap-hazard and unscientific practice into a rational procedure. Not only did he lay down certain indications which form the first ground-work of rational urethral surgery, but he has given to the profession a useful instrument, which has gained universal favor and is still extensively favored. I have used Otis's urethrotome for a good many years, and have little fault to find with it, except that its thorough cleansing and drying was made difficult, if not impossible, by the presence of riveted joints. In addition to this, it was found that these joints frequently became rusted, and broke when in actual use within the urethra. Furthermore, the exact location of a stricture to be cut had to be carefully marked out on the instrument, and a second separate examination was necessary to determine whether the stricture was sufficiently divided. Principally with a view towards the perfection of an instrument capable of thorough and easy cleansing, I have constructed a urethrotome which is simple, strong, which by its bulbous apparatus will correctly indicate the exact location and the extent of every stricture, and in dividing the strictures will at the same time indicate whether the stricture has been cut in its full linear extent and to a sufficient depth for the re-establishment of the desired calibre.

This *aseptic urethrotome* has been used by me for five years, in

over one hundred cases, and has given equally satisfactory service in other hands. It can be taken apart in five or six seconds, and put together in fifteen seconds.

Assuming, then, that this instrument is to be used, it is passed in the closed state, with or without the guidance of a filiform bougie and the tunnel at its beak, through the stricture to be divided. Then it is opened to the desired calibre, which is indicated on a dial near its handle. The penis being grasped by the left hand, the instrument is drawn forward, during which act the stricture, being put on the stretch by the bulb, is divided by the knife hidden during introduction in the beak of the urethrotome. To pass the stricture the knife must cut through all resistant tissue, and at the moment when the bulb of the instrument has passed the strictured portion it may be safely assumed that the desired calibre has been gained. Two, three, or more strictures can be thus divided one after the other without changing anything in the condition of the instrument, which will slip harmlessly through those parts of the urethra which are not constricted, the tension of the normal urethra produced by the dilatation not being sufficient to resist the passage of the small cutting blade. Hence the normal parts of the urethra are never injured by the instrument.

It is necessary to define my position as regards meatotomy. Fortunately, the excessive abuse of this little operation has ceased, it having become generally admitted that a slight constriction at the meatus is a normal desideratum of a urinary nozzle. Whenever we find, then, that the meatus is too constricted to admit of the introduction of any necessary instrument into the urethra, it is divided with a probe-pointed knife sufficiently, and not more, to permit the introduction of this instrument.

As soon as internal urethrotomy, which should always be done along the roof of the urethra, has been performed, and the urethrotome withdrawn, the urethra should be thoroughly flushed with an antiseptic lotion. To prevent secondary hemorrhage a good-sized webbed bougie or catheter should be passed down to the elastic catheter previously brought out through the perineum, and, being tied in, should be left *in situ* for twelve hours. Should considerable hemorrhage occur, the calibre of this webbed catheter should be great enough to exert pressure by distention upon the cut urethra.

I have never encountered, among several hundred internal urethrotomies performed in this manner, one single uncontrollable or even disagreeable hemorrhage. The only serious hemorrhage of my early

personal experience occurred in dividing a stricture of the membranous portion by Otis's instrument, where undoubtedly the bulbar artery was injured, leading to excessive hemorrhage into the bladder, which could be stanchd only with much trouble and prolonged pressure. The patient recovered. Had septic infection been added to this injury, the patient certainly would have succumbed.

Where internal urethrotomy alone is performed, serious hemorrhage following, a full-sized English webbed catheter (I prefer an olive-pointed one) should be passed into the bladder, and left *in situ* for twenty-four hours. Where this is not the case, it is not necessary to distend the urethra at all, and it is sufficient to splint the penis between two well-padded strips of pasteboard or veneering, firmly compressed by a few turns of a roller-bandage. Finally a T-bandage is applied, bringing and compressing the genitals well up over and against the symphysis pubis.

Slight hemorrhages will frequently occur during the first acts of micturition following urethrotomy, which are easily controlled by finger pressure, which the patient can be taught to apply himself. Should such a hemorrhage become rather profuse or prolonged, a webbed catheter is to be passed, and tied in for twenty-four hours.

Where the urine was ammoniacal before the performance of external urethrotomy, drainage of the bladder is to be maintained, and local and internal medication employed until the urine becomes acid, when perineal drainage can be discontinued.

In cases where the urine is acid at the time of the operation perineal drainage is maintained, as a matter of routine, for five days, when dilatation by the daily passage of steel sounds is usually begun. The use of the sound should invariably be preceded by thorough irrigation of the urethra and bladder.

The healing of the external wound will, in the vast majority of all cases, proceed without difficulty. It should be lightly packed with iodoform gauze, which is to be renewed after each urination. Later on the local treatment is based upon general principles. From the third week on the steel sound is passed only twice a week, this practice being systematically continued until the last trace of a tendency to recontraction shall have disappeared.

Whenever patients pass from the surgeon's direct care, they should be instructed in the proper use of the steel bougie, with the warning that neglect will certainly be followed by a return of the stricture.

CONCLUSIONS.

1. Initial gonorrhœal infiltration of the urethral wall—granular urethritis—requires local endoscopic treatment by applications of nitrate of silver, aided by bougie pressure, massage, with or without internal urethrotomy. In the vast majority of cases the formation of permanent stricture can thus be prevented. The proof of cure is the absence of gonococci in the discharges and the re-establishment of the normal aspect and calibre of the urethra.

2. Unchecked granular urethritis usually leads to the formation of permanent cicatricial stricture. Urethrotomy of organic stricture is only a palliative, not a radically curative measure.

3. In external urethrotomy injury of the bulb must be avoided.

4. Internal urethrotomy of the membranous portion should always be preceded by external urethrotomy,—combined urethrotomy.

5. Ordinarily, radical, permanent cure of organic stricture of the urethra, whether of traumatic or of gonorrhœal origin, cannot be expected after urethrotomy; it can be accomplished only by excision of the stricture and suture of the healthy parts of the urethra.

THE OPERATIVE TREATMENT OF GOITRE.

CLINICAL LECTURE DELIVERED AT THE CUMBERLAND INFIRMARY.

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GENTLEMEN,—I have chosen the subject of goitre because in this part of England it has been my lot to meet with a sufficient number of instances of the disease to enable me to speak with some authority.

In dealing with the subject I intend to draw upon my own experience as largely as possible, and to dilate upon the practical points which are of importance in operations undertaken for the removal of portions of the thyroid gland.

This district is remarkable for the beauty of its scenery, due to the great number of hills and lakes which lie thickly scattered over Cumberland and Westmoreland. The rain-fall is in parts heavier than in any other district in England (as at Seathwaite, where it reaches one hundred and forty-three inches a year), and the rivers, though not large, are numerous and frequently in flood at certain seasons of the year, and there can be no question that to the copious saturation or swamping of the soil, is due the frequent occurrence of the disease. Whatever may ultimately be shown to be the conditions favorable to the production of goitre, it must be said that scantily populated as is this district, yet the instance of sudden death from pressure on the trachea are met with here as they do not seem to be elsewhere.

There can be, further, but little doubt that females present themselves for treatment more frequently than males, and this may simply mean that the female sex is ever more alive to the presence of deformities of all kinds, but the fatal cases induced by sudden suffocation as the result of the pressure exerted by rapidly growing goitres are by no means limited to girls.

In passing on to some of the clinical features of goitre, the observer cannot but be struck with the painless nature of the disease, uncertain in the speed of its growth, calling for attention only by its

bulk, manifesting itself in all its dangers only by the sudden manner in which young lives are snatched away at a few hours' notice. It is quite possible that such facts may be incredible to those whose practices do not lie in a goitre-producing district, but unhappily it is in the experience of nearly all practitioners in Cumberland and Westmoreland.

To the grown up a goitre, aside from its hideous deformity, is of no danger whatsoever, but to the girl or lad of fourteen, fifteen, sixteen, or even of twenty-five, an enlarging thyroid gland is full of danger; and the explanation is simple from a mechanical point of view, but from a pathological aspect I can offer no explanation worthy of attention.

In the young the rings of the trachea, formed as they are of soft and elastic cartilage, lend themselves in a dangerous manner to outside pressure; surrounded on three sides, as the trachea for some distance is, by the thyroid gland, all enlargements of the nature of goitre cannot fail to produce an unexplainable and mischievous arrest in the expansion of this air-tube, flatten it when expanded, or cause deviation of the air-tube to one side or the other. With regard to the causes which lead to sudden enlargements of diseased thyroid glands I can, as already stated, offer no explanation. It may be that an easily compressible trachea is so far compressed that it needs but another straw's weight of added pressure to cause death; it may be that sudden vascular disturbance from an unknown cause furnishes this straw's weight of pressure required in order to suffocate the individual; be it as it may, this sudden occlusion of a compressed trachea is so rapidly fatal that the surgeon may reach the bed too late to be of any service.

The largest goitres I have seen have been those in the necks of elderly women, and in such cases there is no danger to life, for the hardened rings of the trachea are able to hold their own against pressure from without from enlargements of this nature.

Let a young person get past twenty-five or thereabout without dangerous symptoms appearing, and in all probability such symptoms will never appear. I have had occasion to operate on a large goitre in middle life, but the reason for so doing was not referable to the danger caused to life.

Perhaps it would be as well to give one or two examples to illustrate what has been said as to dangerous symptoms arising unexpectedly. During a night in September, 1885, I was summoned to the village of Wetheral, four miles distant, to perform tracheotomy. On reaching the bedside, I found a healthy looking girl of sixteen with a large

goitre just dying. An incision down the neck, the thrusting aside of the halves of the tumor, digging a road to the trachea, and the insertion of a tube were rapidly done, because there was no hemorrhage.

Artificial respiration was resorted to unsuccessfully, and a girl, who had up to that time, been perfectly well and who had not been complaining in any way, was thus suddenly snatched away from her relatives. A bit of that girl's thyroid on section showed large spaces filled up with yellow colloid material with intervening septa of fibrous tissue.

Another example in more recent years was that of a lad I never saw. Dr. Briggs, practising at Aspatria, in Cumberland, wished to send me a case of goitre for operation, as there were symptoms of tracheal pressure. I arranged to take the lad; a few days after, Dr. Briggs wrote that he had been summoned to see the lad, and that he was dead when he reached his bedside.

Some years ago I went to a village in Westmoreland to visit the son of a medical friend. The lad had just returned home for his Christmas holidays, and the previous night he had had alarming symptoms of dyspnoea, and his father talked of tracheotomy.

The lad was up, and, but for a large goitre and slight evidence of pressure upon the trachea, there seemed no urgency whatever. It was agreed that upon the first fine day the lad should be brought to Carlisle. The night after my visit he was suffocated before his father could get to his bedside.

These and similar cases which could be related are more than sufficient to prove that, associated with goitre in grown persons of either sex, grave danger in an unaccountable manner may suddenly arise.

Warned by such disasters, it is hardly a matter for surprise if I have thought it right in all cases of goitre in the young, where tracheal pressure was evident, to advise early removal of one-half of the disease.

It may be put forward that tracheotomy will relieve these cases and do away with the necessity for severer measures. Tracheotomy will be found not only very difficult to perform, but practically useless, and the term useless applies also to the division of the isthmus of the thyroid.

In one case I was sent for hurriedly to the Carlisle Infirmary on account of impending suffocation from goitre in a young woman. Division of the isthmus gave no relief, and in order to prevent death one-half of the enlarged gland was quickly removed, with a happy result.

The difficulties of tracheotomy, performed for the relief of the dyspnoea or suffocation in goitre, are due to the enlargement of the

gland on one or both sides of the isthmus. The growth of the gland tends to deepen the position of the windpipe apparently, and render the operation troublesome; next the trachea will be found ill developed.

In the third place, the trachea will be found displaced. Deviation to one side or the other will be commonly met with, or even a multiple curved form may be induced by the pressure. The trachea may be flattened laterally, or it may be flattened from before backward.

It is better to abandon all attempts of that kind, and to relieve spasm or suffocation by liberating the tube of the trachea from adjacent pressure.

This pressure may extend for several inches along the tube, and, if present at the point where the trachea disappears behind the sternum, a tracheotomy-tube would not, unless of great length, be of any service.

By placing the ear near the patient's neck it will be possible, when the breathing is somewhat forced, to hear whether there is any stridor mingled with the breath-sounds. The stridor is frequently audible with tranquil breathing, and in such cases the calibre of the windpipe must be considerably narrowed.

In many cases I have known the enlargement diminish under iodide of potassium given in almost poisonous doses, and the stridor disappear; and if I do not make mention of iodide of potassium as a remedy for goitre, it is because in this lecture the operative treatment is alone discussed. On the other hand, I cannot with my present experience distinguish cases which can be safely treated by iodide of potassium and those which should be operated upon without delay. Some persons are unable to tolerate iodide of potassium, and if so, that would form an additional reason for early operation.

With regard to the morbid condition of the gland found in goitre, it varies much in accordance with the length of time it has existed. In an early and rapidly-growing gland a large deposit of colloid matter exists, occupying the spaces between the stroma of the gland. In cases of longer duration, cysts containing a sanguineous and glutinous fluid may be found, associated with colloid deposit.

In older cases cysts and colloid material may be found, with much fibrous tissue and cretaceous deposit.

Sometimes in recent cases the diseased gland may be found projecting into the bag of a large cyst, into which the entire lobe of the thyroid has been changed.

The isthmus itself may be the seat of cystic formation or of simple enlargement.

The changes enumerated thus roughly may be unilateral, bilateral, or encircling. I have seen one case where the thyroid enlargement stretched behind the posterior pillar of the fauces.

Where pressure has been marked, it will be found that the goitre is usually solid. I have frequently been questioned as to the vascularity of goitres operated upon, and regard need only be taken to those vessels entering the gland from its posterior surface. The interior of the gland is by no means vascular, and a lobe may be cut from its fellow or from the isthmus with scissors, without any risk of troublesome hemorrhage. This leads me naturally to say what my experience has taught me from operations undertaken for the removal of one-half the gland or its isthmus only. No one thinks of removing the whole gland on account of the risk of inducing the general condition known as myxœdema. Indeed, as far as removing a possible source of danger is concerned, there is no need to remove the whole gland, for the trachea is liberated if one-half is taken away.

OPERATION.

With a good light thrown directly on the neck, and with a pillow supporting the shoulders in order to project the cervical region, it has been my invariable custom to make a central incision. The longitudinal veins found beneath the skin can be turned aside with a retractor, and if division of one is unavoidable, it can be tied in two places and cut between the ligatures. On reaching the goitre—and this is soon done, for the sterno-hyoid and sterno-thyroid muscles may not even be seen—it is important not to cut the capsule of the gland, otherwise hemorrhage commences at once, and the operation will be delayed. With the finger I sweep round the tumor and separate all connection with the loose cellular tissue in the deep as well as superficial portions of the growth; at this stage the goitre can be delivered and may be lying outside the skin incision. With the forefinger an endeavor is made to hook the inferior thyroid artery, and if found a silk thread is passed round it with an aneurism-needle. The same applies to the superior thyroid artery; but if these arteries have not been presented in this manner, a careful search must then be made along the deepest part of the attachment of the gland, when, probably close to the trachea, they may be seen and tied carefully before division.

With safe holding of these vessels all risk is at an end. It is true that there may be adhesions to the trachea due to pressure, but these should be separated with the handle of a scalpel, but they never cause any real difficulty; the scissors are also useful in detaching the tumor

from the trachea, provided they are used with an exact knowledge of what is going to be cut, otherwise a snip of tissue deep down in the neck may be attended with troublesome hemorrhage. During the operation I prefer that profound anæsthesia is not induced, because when the goitre is being drawn out of the neck there is sometimes considerable traction of the trachea, and embarrassment of the breathing is thereby caused. My instructions are usually to give rather too little chloroform than too much, it being preferable to have the patient insensible rather than profoundly unconscious.

It is in the course of separating the goitre from the side or front of the windpipe that adhesions spreading over an inch or more of the rings of the trachea are met with, and it is at that time that the various deformities caused by pressure may be seen, to which I have alluded already. The trachea may be seen curved, wedge-shaped, narrowed, pushed out of place, and even may be difficult to find for a moment, except by the touch of the finger. Whilst I have operated on account of imminent danger, I have never had a patient placed in imminent danger in the course of an operation, either by embarrassment of breathing caused by traction on the trachea or from excessive hemorrhage, and these two risks are the only ones attending the operation, excepting always that due to a possible overdose of chloroform. There can be little doubt, however, that the sudden division of the superior thyroid artery in an unexpected moment may create difficulty and even danger. I lay stress, therefore, upon an endeavor being made to either hook this artery with a forefinger, or else to search for it with the naked eye, and to tie it securely before using the scissors. If the breathing is much embarrassed during an operation, there will naturally be much distention of the cervical veins, and if these have been cut hemorrhage will follow. The plan I adopt is to push veins to one side and hold them out of harm's way by retractors. After the skin incision has been made the knife should be used as little as possible, for it will be found that goitres may for five-sixths of their surface be cleared with a finger only, and the remaining sixth will consist of deep adhesions to the trachea and blood-vessels, and for these scissors are to be preferred.

The skin incision must be of sufficient length to allow of the delivery of the goitre in the manner described, but its size or length is of moment only when the resulting scar is taken into consideration. There is, without doubt, a scar left which is very disfiguring upon the neck of a girl, and this has probably induced Kocher to advise a transverse curved incision, when it is desired to avoid disfigurement.

The immediate effects of union of the incision will not appear unsatisfactory, but what occurs is the stretching of the scar and a ribbon-like band is left down the centre of the neck. If the opposite side of the thyroid advances, as it may do, towards the middle line, owing to the space being clear, the scar is liable to be stretched and thinned out. A curved incision with its convexity towards the sternum might possibly obviate the disfigurement mentioned.

With reference to the treatment of the wound, it is as important here as at operations in other parts of the body to leave the wound dry; a sponge may be left in the cavity previously occupied by the goitre, whilst stitches are passed through the skin. With a dry cavity free from oozing, closure without a drainage-tube may be attempted. The most satisfactory union I ever obtained was where no drainage-tube was used: immediate healing was the result, and the patient left the hospital in less than fourteen days. If a drainage-tube is employed, it should be for as short a time as possible, say twenty-four or forty-eight hours.

Pressure should be exerted on the neck after the operation as far as possible, and the head and neck kept rigid by the dressings and bandages.

The immediate effects of the removal of a goitre on one side may seem disappointing, for the stridor not only does not disappear, but may be even a little more evident. In a few days, perhaps three or four, the evidence of pressure will have disappeared entirely.

The healing of the wound may be retarded by a collection of serum in the pouch left, and by the subsequent change into pus; the great object then is to dry the wound and apply pressure, and if possible do without a tube.

I have seen but one case of shock after the operation which I shall allude to presently, and, given the completion of the operation without the loss of more than four to five ounces of blood, there should be no shock apprehended.

The thing most to be dreaded after operation is pneumonia. I have lost one case from this cause, and it arose in a poorly-developed, weakly-looking girl, whose vitality was considerably lowered. Her age was fifteen, and the apex of the right lung was not sound previously. With care to prevent chill in conveying the patient to and from the operating-room, and care to keep the body well covered whilst the operation is in progress, in addition to an operating-room free from dust, these precautions should tend to the prevention of pneumonia after the excision of a goitre.

I should not describe any operation for goitre I have performed as difficult, excepting one, which was done after dark in a small ward, with insufficient light, and where speed was of vital importance; in that case hemorrhage was very troublesome and the vessels difficult to see. Recent cases of goitre are the more simple; on the other hand, the older cases show denser adhesions to the trachea, and usually larger vessels are met with.

Twenty minutes to half an hour is the time needed to complete the operation from the commencement of the anæsthetic.

In liberating the goitre with the finger from the surrounding attachments, it may be necessary to seize the thyroid gland with the fingers of the right hand whilst the forefinger of the left is used for the separation.

When the separation is nearly completed, it may be needful to introduce three fingers into the wound and pass them behind the goitre in order to deliver the tumor outside the wound. I have never touched a goitre with forceps or volsella for traction purposes.

A few words may be said upon the condition of the patient from whom half a goitre has been removed. At first a disfigured condition of the neck is evident, on account of the flatness of one side and the swelling on the other side from the half of the tumor left behind. In the majority of cases the other half of the goitre diminishes in size slowly but steadily, and the asymmetry is soon hardly apparent. In two cases there was certainly a tendency to extra growth in the centre of the neck from the remaining half of the goitre, and I operated a second time on one lad in order to remove the projecting lump, but not on account of any pressure symptoms set up. In order to avoid this it is well to remove all tumor growth from the centre of the neck, and if the isthmus is found enlarged as well on one side, to remove both, because, as has already been pointed out, the removal of one side seems to allow the other half of a goitre to advance towards the middle line; it is this advancement, or in some cases regrowth, that stretches and thins out a well-united scar.

The accompanying plate (see Fig. 1.) illustrates some of the points alluded to.

The representation of the goitre *in situ* came from a patient from Keswick, Cumberland, sent to me by Dr. Crawford.

She was a married woman, aged thirty-six, and was on April 11, 1894, submitted to operation. The tumor was attached to the trachea, but, like old goitres of some size, it tended to hang forward away from the trachea. She was discharged well on the 25th of April.



FIG. 1.—Position of a goitre, seen in profile, which was successfully removed from a woman of Cumberland, aged thirty-six.



FIG. 2.—Micro-photograph of a section of goitre, showing colloid masses in a fibrous stroma.

This operation was not undertaken on account of any danger to life; there was no evidence of pressure on the trachea. The growth on section showed much dense glistening fibroid degeneration of an old standing goitre, a few cysts, some cretaceous change, and a thick capsule. The weight was half a pound exactly. When the head was held straight the tumor filled the space between the chin and the sternum.

The other illustration is a microphotograph, (see Fig. 2.) which shows how the yellow colloid substance fills up the spaces between the stroma of the gland, and this condition will be found in all recent and rapidly-growing goitres.

There is, lastly, the disease known as exophthalmic goitre, upon which something may be said, as operations have not only been advised but undertaken in order to cure this condition. The size of the thyroid in these cases is never very great, nor have I ever known pressure upon the trachea to be marked. I have operated upon one case only, and my experience is not such as to induce me to repeat the operation or to recommend it to others. At the operation there was no special difficulty, one-half of the goitre was removed with ease, and the amount of hemorrhage was inconsiderable the time occupied was brief and the patient was back in bed in less than half an hour. Vomiting, high fever, suppression of urine, nervous excitement, and much lung disturbance, suggestive of commencing pneumonia, followed, and the patient died on the third day. I believe the experience of other surgeons has also been unfavorable.

A section of the tumor showed a great difference between it and those cut from all the other goitres. The appearance to the naked eye is characteristic. The amount of colloid matter is small, the amount of vascular tissue great. The color of the gland is a dark olive green.

In going over the cases submitted by me to operation I find that they number, since 1890, nineteen in all. In ordinary goitre cases there has been but one death, or a mortality of five and a half per cent.

Including the death of the exophthalmic case the death-rate would be ten and a half per cent. for the nineteen cases operated on. The ages of the patients range from ten to thirty-five. In all but one a drainage-tube was used, and in this one healing was the most satisfactory. Troublesome suppuration has followed in several cases, but in the majority there was rapid healing and no trouble. The girl, aged fifteen, who died was not sound; there was phthisis present, but not actively going on.

ABSTRACT OF CASES OF GOITRE OPERATION.

NO.	NAME.	AGE.	DATE.	SIDE REMOVED.	RESULT.	REMARKS.
1	Isabella N.	16	Oct. 11, 1890	Right	Recovery	Two years' duration.
2	John E. M.	10	" 20, "	Left	"	Many years' duration.
3	George S.	14	Nov. 12, "	Right	"	Adhesion to trachea.
4	William J. L.	17	Dec. 1, "	Right	"	Weight, six ounces.
5	Mary A. H.	26	Apr. 27, 1891	Right	"	Growth, hard, cystic, and degenerated. Trachea, small and deep.
6	Annie B.	21	Mar. 18, 1892	Right & Central	"	Isthmus formed bulk of tumor.
7	Jonathan A.	22	" 25, "	Right	"	Size of a large orange; much dyspnoea.
8	Mary B.	25	Feb. 8, "	Middle	"	Six years' duration.
9	Annie E.	19	Aug. 4, "	Right	"	Dyspnoea on exertion. Trachea, small and compressed.
10	Annie I.	15	Sept. 8, "	Right	Died	Pneumonia. Lung not sound previously.
11	Elizabeth K.	24	Nov. 3, "	Right	Recovery	Four years' duration. Dyspnoea alarming.
12	Margaret G.	20	Dec. 15, "	Central	"	Five years' duration. Cystic.
13	Sarah J.	25	Jan. 22, 1894	Left	"	Solid and degenerated. Adherent to trachea.
14	Hannah J.	16	Mar. 23, "	Left	"	Solid. Three years' duration.
15	Mary T.	27	" 18, "	Left	"	Private case. Neurotic subject.
16	Mary S.	19	" 29, "	Right	"	Solid and a few cysts. Two years' duration.
17	Elizabeth H.	36	Apr. 11, "	Right	"	Anæmic. Weight of tumor, eight ounces.
18	Mary L.	35	Nov. 16, "	Right	Died	Exophthalmic goitre.
19	Jaue P.	18	July 17, 1895	Right	Recovery	Large cyst.

Males 4 Mortality for all operations 10.5
 Females 15 Mortality for ordinary goitre cases, excluding exophthalmic case . . 5.5
 19

RESULTS.

Recoveries 17
 Deaths 2
 Total 19

SPREADING OR PROGRESSIVE GANGRENE.

CLINICAL LECTURE DELIVERED AT THE CITY HOSPITAL, ST. PAUL, MINN.

BY PERRY H. MILLARD, M.D.,

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Medicine and Surgery, University of Minnesota; Member of the
American Surgical Association; Surgeon to the City
and St. Luke's Hospitals, St. Paul.

GENTLEMEN,—The word gangrene carries with it a sense of terror to both the surgeon and the patient. From whatever cause, it implies danger that cannot safely be ignored. The literature of gangrene is as ancient as the history of surgery itself. In describing gangrene Hippocrates used the word *ramollissement* (to soften); Celsus used the word *cancrum*; while Liston, Heister, and Pearson used the word *sphacelus* to indicate the same condition. The terms mortification, necrosis, sphacelus, and gangrene are now used synonymously. Amid some confusion the disease has been handed down under different names, but in unvarying form. With hospital gangrene it is somewhat different; students of surgical history question the existence of the disease before the discovery of gunpowder, in the fourteenth century. The construction of large hospitals without means of ventilation was a product of dawning civilization. Concentration of the wounded was a means of propagating disease, particularly hospital gangrene. Richard Wiseman, surgeon to Charles II., thus describes this disease: "The lips sink and are flaccid, a gleet followeth, and the flesh within withers, also the pulse and the sense in the part do both languish." Future historians will describe this disease as existing between the time of the discovery of gunpowder and the period of antiseptics.

In military practice its dread was greater than the bullet. Gangrene may be described as death *en masse*, in contradistinction to molecular death occurring in ulceration.

Classification.—This disease is variously classified. We recognize traumatic and idiopathic, moist and dry, acute and chronic, infectious, spreading or progressive, including in the latter variety the so-called

emphysematous variety or form, symmetrical or Reynault's disease, senile, diabetic, and the class of cases due to thrombi. In practice you will naturally divide or recognize three classes of cases; those arising from traumatisms, infection, and idiopathic agencies.

Etiology.—Early in this course you were informed that inflammation terminated in resolution, organization, suppuration, and gangrene. However, in the study of this disease do not place too much reliance upon the part played by inflammation; it will be of secondary importance. In its study associate therewith the idea of tissue starvation, caused by the arrest more or less completely of the normal blood-supply. This arrest will arise from numerous causes; notably gross traumatic lesions, thrombi, vascular atheroma, vascular contractions, due to stimulation of the arterial coats of a vessel, illustrated in ergotine-poisoning, vasomotor eccentricities, as illustrated in Reynault's disease and tissue, death arising from various constitutional diseases.

Symptoms and Clinical History.—The clinical history of a case of gangrene will be greatly governed by its etiology. If due to internal vascular obstruction, as atheroma or ergotine-poisoning, it will result in dry gangrene, run a somewhat protracted course, and little danger arise from the disease itself. Mycotic invasion is the exception in this form of the disease; a line of demarcation is established, and unless life is sacrificed by some intercurrent affection, nature will ultimately throw off the offending part. Upon the contrary, if due to a traumatism, the disease will run its course in a few days. There will be vascular obstruction, which, if relieved in a sufficiently early period after its occurrence, may and probably will result in resolution, with limited loss of tissue. If the vascular obstruction be not relieved, evidences of tissue necrosis are soon apparent, and in a few hours at farthest the limb or part will have been sacrificed. It is the moist form of gangrene that follows a traumatism. Its phenomena will be well marked both in its local and general manifestations. If the part is not sacrificed early after the death of tissue supervenes, pronounced general symptoms are at once manifest. During or immediately supervening upon the surgical reaction we have developed, from the natural interchange of tissue-products, an active septicæmia. Without the intervention of the surgeon at the proper time, the case terminates fatally in a few days at the furthest. It is my experience that in moist gangrene a certain amount of septicæmia prevails at a very early period in the disease. This is due to the fact that it is quite difficult to reach the deeper tissues by antiseptic dressings immediately after the death of the tissue has taken place. You will find in actual practice that

unless ablation is performed at an early period following the death of the part a fatal septicæmia is certain to develop.

Unless in cases of strangulated hernia I know of no condition where undue conservatism is so liable to be followed by disastrous consequences. In a small proportion of cases we have developed a remarkably rapid form of septicæmia that destroys life in from three to ten days. It is this variety of the disease that is classified as progressive or spreading gangrene. I wish particularly to direct your attention to this variety of the disease in the lesion presented by this patient. This complication or, perhaps better, this variety of the disease is due to the invasion of the tissues by one or more forms of bacteria; occurring, of course, in traumatisms attended with an open wound. We look at a majority of these cases as due to mixed infection. Our pathologists, however, advise us that the *staphylococcus pyogenes* is the germ most frequently encountered. Progressive gangrene is more frequently encountered in the lower than the upper extremity. A majority of the cases will occur in compound fractures. You may have left your patient at a former visit in an ideal condition, and upon your return find the tissues hot, tense, with a sense of burning and throbbing. Upon examination it will be easy to determine that we have an infected wound to deal with. The cellular tissue soon becomes boggy and cedematous, great quantities of serum exude from the wound, the skin becomes of a dark bronze hue, looking like the rind of pork or bacon; later assuming a greenish or black color. Dark streaks follow the vessels and lymphatics throughout their entirety. The entire limb assumes a brawny aspect early in the history of the disease.

In not a few of these cases we have developed an extensive emphysema due to the entrance of air into the tissues or to the saprogenic germ. This condition is spoken of as the emphysematous variety by some authors. The dead tissue is a fruitful medium through which the germ is propagated. Germ proliferation is aided by moisture and the temperature of the part. Rapid disintegration results, together with an early manifestation of toxine absorption. If the tissues become emphysematous and any considerable portion of fascia or skin is intact, pressure reveals an extensive emphysema wherever cellular tissue is found in large quantities. If we open the tissue at this time bloody serum and gases escape. The color of the tissues is most varying. A later examination, after the limb is partially mummified, will reveal a sodden appearance of the tissues, which are of a grayish aspect, the muscles being pulpy, the bones dry and deprived of their periosteum.

The medullary canal maintains its normal aspect until a late period in the progress of the case. The varied colors in gangrenous tissue are due to decomposition of the red corpuscles. The characteristic odors are due to sulphuretted hydrogen and sulphuret of ammonia.

General Treatment of Gangrene.—In the treatment of gangrene it has been the aim of surgeons and authors in former times to lay down certain rules for the guidance and management of the various forms of this disease. Like the common law, these rules have been handed down from a period of time so ancient that the memory of man runs not to the contrary. They have come in stereotyped form and frequently not adapted to cases as met in practice.

These rules pertaining to the propriety of amputation in moist gangrene are still quite rigidly adhered to by many surgeons. They are as follows :

First. In all cases of traumatic gangrene extensively involving the components of the limb, where the line of demarcation is established and the strength of the patient is not too greatly exhausted, there can be but one opinion as to the propriety of an amputation ; this should be done as near to the line of separation as will allow of the formation of sufficient flap.

Second. In incipient gangrene of traumatic origin—that which begins at the so-called primary period (from thirty-six to forty-eight hours)—the surgeon should operate at once, without waiting for any line of separation ; providing the patient's general condition will allow. Gangrene from extremes of temperature, such as heat or cold, constitutes an exception to this rule ; in such conditions amputation must be preceded by the line of demarcation.

Third. In cases of traumatic mortification, where the disease is well established and rapidly progressing without any line of separation, an operation is not justifiable, because the surgeon cannot determine where to apply the knife. Such a case has more than a local significance, it belongs to the mixed class of cases of gangrene,—that is, the effect of the injury is not confined to the surface of contact with the vulnerating body, but extends to the vascular and nervous structures of the entire limb, with often the presence of a general factor, such as shock to the entire system, concussion of the spinal marrow, if such be possible, a heart defective in power, or a diseased state of the kidneys. We must wait for nature's sign,—a line of demarcation. I know this rule is directly antagonistic to that of several very eminent authors ; but I am so convinced of its correctness that I can make no modification, at least in civil practice (Agnew).

Fourth. When mortification is due to embolism or ergotism,—in the one case obstructive and the other anæmic,—or to any cause that has no local explanation, systemic causes are in operation, and the knife must be withheld until the limitations are fixed, when, if the strength of the patient does not forbid, the amputation may be performed.

Fifth. When mortification follows the application of a ligature to an artery, as the brachial or the femoral, the case is purely a local one, the collateral branches being unable to convey the blood to the parts below, and therefore there is no necessity to wait for a line of demarcation; the limb should be amputated above the seat of ligature.

Sixth. When mortification follows an injury to a main artery, either from gunshot or from violence, the cause is a local one, and therefore there is no injury. The death of a part after such an injury or damage is analogous to that which sometimes follows the ligation of an artery. The result of amputations will be quite problematical in moist gangrene, as a fatal sepsis is likely to have developed before resorting to operative procedures. In gangrene arising from thrombi, it will be necessary to make your incisions above the clot. In septic cases avoid the admission of septic products into the general circulation, if possible. Having obtained as great a degree of cleanliness as possible, the limb should be elevated, and constriction made at a point above that selected for the proposed incision. Do not use the Esmarch bandage in the procedure. In septic cases considerable oozing is the rule, likewise great shock, which is to be anticipated and provided against as far as practicable. Unless you are quite positive your field is aseptic, drainage should be provided. In septic cases the prognosis is soon determined; an amelioration of the symptoms or death is the rule in a few hours at the latest. In operations for dry gangrene, as a rule, considerable time will elapse in most of the cases before we can determine the result. Reamputation may become necessary in a small proportion of cases. The constitutional treatment of gangrene should be pre-eminently supporting. Never adopt the so-called antiphlogistic treatment. If your patient's temperature becomes alarming, attack the gangrenous tissue by making free incisions, thus affording an outlet to all pent-up material; following your incisions by absorbent antiseptic dressings. I have seen this method of procedure followed by immediate amelioration of all alarming symptoms; while if an antipyretic had been administered it would have weakened the heart's action, leaving the infected field undisturbed. Upon the contrary, if little danger of sepsis exists, as

will be the case in dry gangrene, it would be criminal to precipitate an amputation, as the patient's condition is usually such that the shock of an amputation is greatly to be feared. Under the latter circumstances it will be wise to await the formation of a line of demarcation, maintain asepsis as far as practicable up to the time determined upon for the ablation of the necrotic tissue. It is true that in moist gangrene this advice is difficult to carry into execution. Much can be accomplished, however, by antiseptic poultices. Having concluded upon ablation of the necrotic tissue, aim to make your incision through healthy tissue, in the moist variety, as far as safety will permit. In dry gangrene the condition of the patient will only permit of shaping the flaps so as to cover the tissue to be sacrificed. Of course, if your patient is in condition, make all operative procedures through healthy tissue. In septic gangrene it is difficult to determine when your patient has reached that point that an operation may not be safely undertaken. In my experience amputation has been followed by recovery in two cases where my patient was septic and in a condition of advanced coma. Heuter relates cases where early amputation saved the lives of patients that were well advanced in coma from sepsis, the amputation being made without the aid of an anæsthetic. Permit me to impress upon you again most emphatically that amputation should be performed early in all cases attended with the absorption of septic products; and further, that it can be quite safely delayed in cases not attended with the absorption of septic products. The result of amputation will be quite problematical in moist gangrene, as a fatal sepsis may have developed before resorting to operative procedures. In gangrene arising from thrombi it will be necessary to make your incisions above the clot. In septic cases avoid the admission of septic material as much as possible during your operative procedures. The limb should be elevated and constriction made at a point above that selected for the proposed incision. Do not use the Esmarch bandage in the operation. In septic cases considerable oozing is the rule, likewise great shock, which is to be anticipated and guarded against as far as practicable. Unless you are quite positive that your field is aseptic, drainage should be provided. In septic cases the prognosis is soon determined, an amelioration of the symptoms or death being the result in a few hours. In operations for dry gangrene, as a rule, considerable time will elapse in nearly all instances before we can determine the result. Reamputation may become necessary in a small proportion of the cases. The constitutional treatment of gangrene

should be pre-eminently supporting. Never adopt the so-called anti-phlogistic methods of practice. If your patient's temperature becomes alarming, attack the gangrenous tissue by making free incisions, thus affording an outlet to all pent-up septic material; following your incisions by absorbent antiseptic dressings. I have seen this method of procedure followed by immediate amelioration of all alarming symptoms; while if an antipyretic had been administered it would have weakened the heart's action, leaving the infected field undisturbed. In moist gangrene, support your flagging heart by diffusible stimulants, strychnia, digitalis, and nitro-glycerin. In the senile variety of the disease you will find additional remedies indicated in the use of the bitter infusions and the mineral acids.

In hospital practice too great care cannot be exercised in preventing infection of other patients by careless nurses and attendants. The patient's room should be large and well ventilated: a strong deodorizing agent being used in the room. I am pleased to be able to submit this patient, together with the history of some other cases recently encountered in practice, illustrating spreading gangrene. These cases clearly illustrate the benefits that arise from early surgical interference.

CASE I.—L. M. R., aged thirty years; nativity, German. This man was admitted to my service at this hospital with the following history: Twelve days ago, October 27, patient was struck by the limb of a falling tree, resulting in a long ragged wound of the leg and thigh, extending from the lower popliteal space upward to a little above the junction of the middle and lower third of the thigh anteriorly. He remained in the lumber camp two days and was seen by a physician at this time. He was then removed to his brother's residence in this city, at which point he remained until brought here, November 9. Three days after the injury he noticed loss of sensation in the injured member, followed by evidences of gangrene, which first appeared November 6. At time of admission he had a rapidly spreading gangrene extending to a point above the knee-joint. The tissues were extensively emphysematous to a point including the lower portion of the thigh. Although the primary cause of gangrene in this case was vascular obstruction, with the probability of loss of a goodly portion of the limb, the case becomes doubly interesting from its behavior after the injured tissues have become septic. The history of this case, as far as obtainable, indicates but little trouble until the local manifestations of sepsis; at which time the patient was suddenly overcome by septicæmia; his pulse being 130, compressible and wiry when examined by me;

temperature, 104° F., and senses practically obliterated from coma. Respiration was rapid and shallow; the skin clammy, with all the evidences of approaching dissolution. Amputation was advised at once and consented to by the patient; ablation being performed at a point through middle third of the thigh. Patient rallied rapidly, the symptoms of septicæmia soon disappearing. All went well until the end of the fourth day, when a hemorrhage occurred from the femoral artery. The stump was immediately opened and the bleeding vessel ligated. The tissues of the stump indicated the presence of infection. November 30, a second hemorrhage occurred, this time very free, endangering the patient's life. Pressure was made until my arrival, when I ligated the femoral in the apex of Scarpa's triangle. An examination of the stump was made, the suppurating tissues were curetted, the flaps brought together, and drainage established. December 4, the patient bled again from one of the deep anastomosing branches. I again ligated, this time at the terminus of the external iliac vessel, after which no further trouble was experienced. The repeated hemorrhages in this case were due to mycotic invasion, the patient well-nigh losing his life.

CASE II.—J. P. B., aged sixty-three years; nativity, American. In a runaway this man jumped from his wagon, striking squarely upon his feet, producing from the force of the momentum a compound dislocation of the ankle-joint. The rent in the tissues was about two inches long and filled with mud. The limb was dressed some hours after the receipt of the injury by the application to the parts after reduction of the meat of a freshly-killed chicken. At the end of ninety-six hours local disturbances became manifest, resulting, in my opinion, to a great extent, from the infection caused by the unsurgical dressing. When called at the end of the ninth day I found the man profoundly septic. The limb was necrotic to the knee and partially so in the lower third of the thigh, the emphysematous condition extended over the greater portion of the thigh, which was streaked and greenish in the course of the vessels and lymphatics. The odor from the gangrenous limb was quite intolerable. The tissues were intact except at the point of original solution. The history presented was conclusive, but the condition of the patient was such as to anticipate a fatal result. I advised an amputation, which was readily consented to, the limb being removed at the junction of the lower and middle third of the thigh. The operation was borne better than anticipated, amelioration of the symptoms of sepsis at once manifesting themselves. The patient made an uneventful recovery.

CASE III.—A. E., aged twenty-six years ; occupation, lumberman ; nativity, Scandinavian. While breaking a landing his foot became entangled in the logs, causing a compound comminuted fracture of the leg at the junction of the lower and middle thirds, together with considerable laceration of the soft parts. The injury occurred remote from a point where surgical aid could be obtained, and was in consequence dressed without any regard for cleanliness ; when seen by me three days after the accident, sepsis had already developed. The fracture and injury to the tissues were of a character that would lead me to anticipate a favorable issue with proper care at the time of the receipt of the injury. On examination, the limb was necrotic below the ankle-joint, and evidences of absorption of septic material were plainly manifest by the greenish streaks running up the course of the veins and lymphatics. The septic symptoms already manifest became more pronounced under enforced non-surgical treatment, caused by the patient's refusal to submit to my request for an immediate amputation. It was three days before he consented to an amputation, when it was found that it was necessary to perform the operation at a point immediately above the condyles of the femur. Recovery from the septicæmia was immediate, the man making an uneventful recovery.

SYPHILITIC ULCERATION WITH STRICTURE OF THE BOWEL; COMBINED INTERNAL AND EXTERNAL HEMORRHOIDS.

CLINICAL LECTURE DELIVERED AT THE KENTUCKY SCHOOL OF MEDICINE HOSPITAL.

BY JOSEPH M. MATHEWS, M.D.,

Professor of Surgery and Diseases of the Rectum in the Kentucky School of Medicine, etc., Louisville, Kentucky.

GENTLEMEN,—As we have several cases to operate upon this morning, I desire first to read the history of a case that has been under the observation of Dr. Nichols. We will presently examine the patient and see if we agree with his conclusions as to the diagnosis :

Mrs. Lena H., aged thirty-six ; married ; one child, aged sixteen years. Contracted syphilis from her husband. She first noticed some rectal trouble eighteen months ago. Has constipation and frequent diarrhoea, in the attacks of which there is a profuse degenerated tissue discharge of blood and mucus. Suffers much pain prior to the evacuation of her bowels ; after an evacuation the pain is more severe, lasting an hour or so, and from which she is very much prostrated ; sharp, darting pain in the rectum, pain in the back, inguinal region, and thighs.

I first saw the patient seven days ago ; an examination revealed the existence of a peculiar gritty, granular-feeling mass two and one-half inches above the sphincter, forming a band about an inch wide, completely encircling the rectum. A complete fistula was also present. The granular condition *breaks down* easily and bleeds readily.

Conclusion : Syphilitic diathesis with cancerous ulceration.

You will meet in practice no more important cases than these. The rectum is the seat of a great deal of serious trouble. We are apt to be impressed by the fact that rectal diseases, or rectal affections, consist only of piles, hemorrhoids, polypi, slight ulcerations, and things of that kind, which do not amount to a great deal ; this is a great mis-

take, and you will find that it is the favorite seat of cancer of different varieties, of syphilitic ulceration, strictures, any one of which may not only destroy the usefulness of the individual, but may destroy life.

Dr. Nichols has given us here succinctly the history of a very serious disease, and we may say that the diagnosis rests between only two conditions. I want you to remember when you go into practice that there are only two main factors concerned in the production of serious ulceration or stricture of the rectum. As I have said to you on former occasions, you will not very frequently find benign ulceration of the bowel that is doing any serious harm. In eighteen years' practice limited to rectal diseases, I have found but very few benign ulcerations of the bowel that amounted to anything. But when you do find serious ulceration with contraction or constriction, such as is present in the case before us, you have to deal with one of two things: It is either cancerous or syphilitic ulceration. Now, the only question is this, Is it possible that in the beginning you can have an ulceration of a specific character, and later on, as in the case before us, there may be engrafted upon this a cancerous degeneration? No one can say but that this is true. Therefore one man may make a diagnosis one year of syphilitic ulceration, and in two years thereafter another man may make a diagnosis of cancer in the same patient, and both be correct. I have no doubt of this, for I believe that the syphilitic deposit that is thrown out may eventually undergo cancerous degeneration. Therefore it shall be my purpose to try and make for you a diagnosis, and have Dr. Green do the same, in this case.

We have here, gentlemen, a serious condition. The patient, however, appears to be in very good health; she has probably lost not more than ten pounds in flesh, yet, according to the history which I have read, she has been suffering from rectal trouble for eighteen months, and it is probable that the disease has existed for a longer period, because we know that rectal diseases sometimes do not manifest themselves by any special symptoms for a number of months, or maybe a year; especially is this true in ulcerations of the bowel. We can safely say, therefore, that this woman has had some rectal trouble for two years, yet she has lost only ten pounds in flesh. Of course any one is liable during a year's time to lose ten pounds in flesh without any constitutional disease. This woman also has a complete fistula in addition to the ulceration of the bowel. If we were to operate upon this fistula and leave the ulceration alone, what

good would we accomplish? This fistula is not the cause of the ulceration: it is secondary, and the ulceration is the cause of the fistula. It is not a *progressive* fistula at all, but simply a sinus running down, as you see, for some distance, and more than likely it has a communication above the ulceration of the bowel; therefore an operation upon the fistula would do no good.

The largest mass is one and one-half inches in the rectum, involving the sphincter muscle; it is indurated, and as I push my finger farther in, it is met by a stricture which closely grasps it; the gut above that contains some deposit. I may say that above the stricture the deposit completely encircles the gut. This is what the doctor has described as a granular condition; very correctly so: it feels that way to the finger. He says that it breaks down easily; I notice that it is disposed to do so when I press my finger on it. He has told us that it bleeds freely; further, that this band is two and one-half inches above the sphincter muscle. I do not think it is quite that distance from the sphincter, because it begins to involve the sphincter itself, then the band goes around or completely encircles the gut. The capacity of the gut above the stricture is very good; there is no building-up process established at this stage of the disease, although it is making itself manifest.

The fistula, which is located in the right side, evidently has its origin above this band, as I remarked a moment ago, and is complete.

I want to say that a speculum would reveal nothing to you as far as making a diagnosis is concerned; it would only show a space of ulcerated gut, which would indicate nothing more than you can feel.

Dr. Nichols says this patient has had a slight eruption on the forehead, with some loss of hair; she has had throat trouble, giving a clear history, as the doctor has told you, of syphilis.

Now, as I have said, this is a serious condition of the bowel, because there is an ulceration that extends completely around its surface and a contraction, which means stricture. I would ask that you carefully go over in your minds and try to define everything in the case that would seem plausible in the production of this condition, outside of the two mentioned,—viz., that of specific origin and cancer. If the stricture had been caused by pressure, as, for instance, a child's head during pregnancy, you would have a stricture annular in shape, involving simply the mucous membrane. There would be no extensive ulceration. This stricture, then, is secondary to the ulceration, so that the ulcerated bowel is but a deposit thrown out around the surface of

the gut; thus contraction results. Admitting these premises, then we can have stricture of the bowel only by the deposition of material, gummatous in nature in syphilis, and cancerous in nature in cancer. Now, I am inclined to believe that this ulceration and the resulting stricture are purely of specific origin. She gives the history of syphilis; the lapse of time is just sufficient for ulceration to have occurred; it is followed by the stricture that we expect, and if this building process goes on, in a year from now she will have not only one stricture, but perhaps two or three. In other words, the rectum would eventually become blocked, for she now has a stricture which only admits the forefinger. I say, then, that I believe it was of specific origin. Does it still maintain the characteristic features of syphilis, or has it undergone a degeneration which we would pronounce cancerous? I am constrained to differ from Dr. Nichols in this particular. His diagnosis is, "A syphilitic diathesis with cancerous ulceration." I do not believe this ulceration is malignant; I do not believe it for several reasons:

1. That its progress has not been sufficiently rapid.
2. That this woman does not show the cancerous cachexia.
3. Notwithstanding the fact that the trouble has existed eighteen months, she has lost comparatively little flesh.
4. Touch does not reveal to me that peculiar condition that is evidenced to the finger in malignancy.

In cancer of the rectum you have an indurated nodular condition, which can be clearly and unmistakably made out. You have evidence upon insertion of the finger of great pains, increased by manipulation, yet in our examination this woman did not flinch. I say it is syphilitic instead of cancerous, because she gives an unmistakable history of syphilis, and that she has had constitutional syphilis; that we have here a gradual ulceration, next a deposit, then stricture.

As to the symptom of bleeding: I wish to say distinctly that I have seen many cases of cancer of the rectum that did not bleed as the authorities describe, just as I have seen cancers of the rectum that did not have the peculiar pathognomonic odor that the authorities describe. Whereas this may have bled under Dr. Nichols's manipulation, you will notice that it did not bleed this morning, as evidenced by the appearance of my finger upon withdrawal.

Therefore, to sum up, I believe that this woman has a true syphilitic ulceration with stricture of the bowel. It is not so far advanced that she cannot be materially benefited by antisypilitic medication.

Now, I have told you that I believe this woman has a well-defined

syphilitic stricture of the bowel, which is just as incurable as cancer. These people continue to live a miserable existence, but finally die of this trouble. However, in this case we find the gut in good condition above the band of deposit, therefore I am inclined to believe if this woman receives some local treatment for the ulceration, with dilatation of her stricture, and is put upon antisyphilitic medication and is kept upon it for a long time, she stands a chance of preventing at least any advance in the ulcerated condition of the bowel. She appears to be in good condition, she eats and sleeps well and has kept her flesh. Consequently that will be a great aid to us in preventing an advance of this ulceration.

I will therefore suggest that her stricture be dilated; when I say that, I mean *forcible* dilatation, because the stricture is within reach of the finger; that the ulceration be curetted; that afterwards it be treated by local applications, and that she be put upon antisyphilitic medication. And I would like to have the pleasure one year from to-day of exhibiting this patient to show how much she has been benefited by the treatment.

You might ask what we propose to do with the fistula this woman has. You will notice that it is simply a channel; that there is no diseased condition of the fistula to affect the tissue; that it is narrowed down and has a lining of hard membrane; that there is no discharge to speak of from it; that it is secondary to the ulceration; therefore I say leave it alone until after we have given this woman a fair test with the constitutional and local treatment that I have suggested.

At the same time the question might be raised whether we should remove the external hemorrhoidal condition present,—the superfluous skin which is slightly inflamed. Under ordinary circumstances I would remove it, but I want to make one point just here: if this were a cancerous condition I would let it alone. The question is this: if you have a cancerous condition involving the anus, and this is very close to it, and you were to cut off the skin of an external pile, in the first place you are doing very little good to simply remove this superfluous piece of skin, but you are leaving exposed a new wound which may become attacked by the cancerous ulceration. And, therefore, by making this wound of the anus, you invite an infection by cancer of a part that was not infected before. It gives her very little trouble now, and it might in the event of cancer give her a great deal of trouble. Therefore I say, when you dilate, for instance, a stricture of cancerous origin near the anal orifice, even if you find that the

patient has a superfluous amount of skin around the anus, leave it *intact*.

It was the old idea, I suppose based upon observation, that if you operate upon a cancer it will increase its growth rapidly if you do not cure it. You will find women who will say to you, "I don't want this trouble removed from my breast, because I have been told I will die much sooner than I would if it were left alone." This is the idea they have had impressed upon them, that cancer operated upon, unless peradventure it should be cured, rapidly goes on to destruction. There is some truth pathologically in this statement. Consequently all superfluous skin around the anus, in dealing with cancerous growths, I would let alone.

CASE II.—The next case is one of combined internal and external hemorrhoids. You will notice that this is a combined condition, because there is extensive strangulation. We will first remove the external portion, then draw down the internal pile from above. It makes a very different operation from the ordinary procedure for relief of hemorrhoids. Mr. Allingham recommends that we always cut into the so-called sulcus, the line between the hemorrhoidal structure proper and the mucous membrane; the white line, in other words, between the mucous membrane and the true skin: I have never been able to locate it with any degree of certainty. I find no complication arising, and after transfixing the piles they are ligated and cut off. We will then dilate the sphincter muscle thoroughly, as I have told you, to save this man having pain afterwards, because it will take the sphincter several hours at least to regain itself, and that amount of contraction after doing surgical operations upon the rectum does not exist except in a slight degree if you divulse the sphincter muscle. Having incised, ligated, and removed the external pile, the internal portion is plainly observed protruding, and is very large. Instead of cutting in the sulcus I will go entirely around. I would caution you again as regards tying the ligature in removing hemorrhoids; putting the needle with a double thread through the centre of the pile at its base, we tie the ligature tightly on each side, then with one end of each thread we tie again all the way around the pile, thus making a double ligation. Without this precaution, if the ligature were to give way, it would be a very serious mishap, and bleeding might be sufficient to cause death. After a few hours this patient will have no pain, the anus will be perfectly smooth, and in about eight days the ligatures will be off. We will dress the wounds with iodoform gauze, after irrigating the field of operation with a 1 to 5000 bichloride solution.

These patients are always prepared for operation by being given a thorough bath and a purgative the day before; the next morning a bath and an enema; then they are brought into the room and the operation is done under the strictest rules of asepsis. Dressings will be allowed to remain for two and one-half or three days, when a purgative will be given, the dressing removed, and the bowels allowed to act. Every day thereafter for five or six days the wound will be irrigated with a bichloride solution or carbolyzed water, and an iodoform dressing reapplied, and over this the regular cotton bandage. To prevent suppuration, or for protection against hemorrhage, it is well to introduce a speculum or dilator, and through this insert a piece of gauze; then withdraw the instrument, leaving the gauze intact. With this precaution there could not be a death from hemorrhage, because pressure upon the gauze would be sufficient to check it. In this case there is no reason to believe that there will be any hemorrhage; but, if you feel uneasy at any time and think hemorrhage might occur, or in cases where hemorrhage is more or less profuse during the operation, or when operating upon patients having a hemorrhagic diathesis, if gauze be inserted into the bowel as I have described, the sphincter muscle will grasp it, then by packing gauze against the anus on the outside and putting cotton and a bandage tightly over this, it will obviate all danger of hemorrhage.

A SUBSTITUTE FOR WHITEHEAD'S OPERATION FOR HEMORRHOIDS.

CLINICAL LECTURE DELIVERED AT THE BALTIMORE MEDICAL COLLEGE.

BY SAMUEL T. EARLE, M.D.,

Professor of Physiology and Diseases of the Rectum in the Baltimore Medical College.

GENTLEMEN,—Recognizing in Whitehead's operation a procedure specially adapted to meet a certain class of cases of hemorrhoids,—viz., where the entire circumference of the rectum is studded with hemorrhoidal tumors, associated with extensive varicosities around the anus, at the same time bearing in mind the frequent failures to secure union by first intention and the consequent ulceration and stricturing that are likely to follow, even in the hands of the best surgeons,—I thought the following substitute would secure the same results and not be followed by similar risks, and so it has proved in my hands.

I would like to premise these suggestions with the statement that, unquestionably, I think in all forms of hemorrhoids the best plan of operating is to remove them by the scissors or knife, control hemorrhage, and secure rapid union by drawing the raw edges together with a running suture of catgut, in every case making the field of operation as aseptic as the conditions will permit. Instead of beginning the incision at the white line, as in Whitehead's operation, dissecting up, and excising the whole of the pile-bearing mucous membrane around the entire circumference of the rectum, drawing the proximal end of the mucous membrane down and stitching it to the cutaneous surface, I prefer to excise each internal hemorrhoid separately, either longitudinally with the long axis of the rectum if the hemorrhoid is pedunculated, or transversely if it is sessile and very broad at the base.

Before excising them I grasp the one to be operated upon with catch forceps, and draw it downward and outward. I then pass a quilt suture through its base, tie the two ends of the suture together, and give it to an assistant to hold. The object of this is to prevent the mucous membrane from retracting after the hemorrhoid has been ex-

cised. The two cut edges are then brought neatly together and held by a continuous catgut suture, which also controls effectually all hemorrhage. Each internal hemorrhoid found is treated in a similar manner.

I would caution the operator against letting the lower part of the incision extend down on the cutaneous surface, or even down on the smooth mucous surface that lies just below the columns of Morgagni and over the external sphincter muscle, for reasons that will appear evident later. In dealing with the external varicosities I take out an elliptical piece of tissue on each side of the anus, extending from the anterior to the posterior commissure, the width of which depends upon the amount of redundant tissue. I then take out with the scissors, or sharp curette, all varicose vessels that I find in the sulcus around and external to the external sphincter muscle. I then bring together the edges of the wound with a continuous catgut suture. After both sides are thus treated, I apply the dressing as a compress to prevent any effusion of blood into the sulcus from the point where the varicose veins were removed. This need only be kept up for the first twelve hours.

The advantages claimed for this operation are its simplicity and entire freedom from the risk of stricture following the ordinary radical operation, inasmuch as we have between the stumps of the excised internal hemorrhoids and the external incision a considerable strip of healthy tissue. You are also far more likely to obtain an aseptic wound where only small surfaces are exposed at one time, and which are each closed up immediately.

THE PROPHYLACTIC FLAP METHOD IN SURGERY.

CLINICAL LECTURE DELIVERED AT THE CITY HOSPITAL, ST. LOUIS.

BY G. WILEY BROOME, M.D.,

Professor of the Practice of Surgery and of Clinical Surgery in the St. Louis College of Physicians and Surgeons; Professor of the Principles and Practice of Surgery and of Clinical Surgery in the Woman's Medical College; Surgeon to the Woman's Hospital, St. Louis.

LADIES AND GENTLEMEN,—Surgeons have been so deeply absorbed of late in bacteriological investigations, experimental researches, and clinical observations relating to inflammatory diseases, together with the problems respecting the comparative value of antiseptics, that as a consequence the principles underlying the processes of the physiological repair of a wound have been almost wholly neglected, so that we shall endeavor in the clinic to-day to direct your attention to this aspect of surgery.

I have given much time, thought, and experimentation to studies directly along these lines, and as a result of clinical experience and practical observation I am led to believe that an occasional life is lost from suppurative infection that may take place in the suture wound of the skin in spite of every known precautionary method to prevent it except the prophylactic flap.

While our methods to secure an aseptic surgical procedure are almost perfect, it has been conclusively demonstrated, I believe, to the mind of every surgeon that it is in some instances impossible to render the skin of a patient through which the operation is to be made perfectly free of pathogenic microbes. The fact is constantly being forced upon the surgeon's clinical observation that the staphylococcus epidermidis albus lives beneath the external layer of the skin, and cannot be removed from its local habitation by measures that will not entail destruction of the entire integument in which it dwells. We furthermore realize that this or any other pathogenic microbe never migrates beyond this position unless an avenue is established for its passage. We know also that the integument is the great bulwark against the

entrance of pathogenic micro-organisms to the underlying tissues, which, when they have been penetrated, furnish every requisite for the rapid growth and multiplication of the microbes themselves, as well as for the production of their toxins. So that it may be said that the intact skin is positively invulnerable to the pathogenic micro-organisms, whereas the underlying tissues are just as positively vulnerable; that is, the former is an absolute protection against the attacks of the pus microbe, while the latter furnishes an ideal soil for its growth and proliferation. These facts must be kept constantly before us if we ever hope to attain something approaching the ideal in the scientific practice of surgery.

Coming directly to the principal point we propose to discuss and demonstrate at this clinic to-day, I may say it consists chiefly in making a wound through the skin at a remote distance from the wound through the underlying tissues; that is, the prophylactic flap operation. Let me introduce our work this afternoon with a brief reference to a subject in surgery which is inseparably associated in a practical way with the method of procedure I am about to demonstrate. I mean the subject of bringing tissues of an homologous nature in apposition only when closing a wound by means of the suture. It is absolutely incumbent upon us as progressive surgeons, in the light of our knowledge relating to the reparative processes, to revolutionize the unscientific and unfortunate practice of closing a wound which includes skin, fascia, muscles, and other tissue by one single suture. In all operative methods, let me emphasize, we must keep the fact constantly in mind that the law of the specific genetic nature of tissues prevails throughout, and the epiblastic, hypoblastic, and mesoblastic tissues should not be divorced from the germinal layers to which they belong and amalgamated with one another, if we wish to avoid subsequent pain, deformity, impairment of function, and perhaps a life of misery.

What is meant by this may be more clearly impressed upon your minds by describing in detail the operation of amputation, and as the detail of the technique as I shall describe it does not appear in any of the text-books on surgery now published, I trust you will pay close attention and note carefully each step, for if the true and unamalgamated histogenetic function of repair is initiated and completed according to natural laws, it will insure *restitutio in integrum*, the ideal of scientific progress. Then before proceeding step by step let us select for our illustration the amputation of the thigh three inches above the centre of the condyle of the femur, for in the light of prosthetic science this is the true point of selection for amputation at or above the knee.

REQUIREMENTS FOR THE PERFORMANCE OF AN ASEPTIC OPERATION.

1. Purification of the instruments in the Arnold sterilizer, the disinfection of the hands of the operator and of the entire limb of the patient.

2. The production of artificial anæmia by elevating the limb and the application of the constrictor several inches above the point at which it is proposed to amputate.

3. Fashion a long, anterior flap by extending the incision down to the sheaths of the muscles and tendons. The entire flap is reflected by dissecting closely to the muscle and tendon, a short posterior flap is reflected backward by a like dissection, when the muscles are severed by a clean, circular sweep of the knife down to the bone.

4. About an inch of the periosteum is then exposed below the point at which it is proposed to saw the bone. The periosteum now being incised is reflected upward, after the fashion of a cuff.

5. The soft parts are now to be retracted by an assistant by means of iodoform gauze. The bone is then sawed at an oblique angle for about one-quarter of its thickness, when the saw is withdrawn and placed at a right angle with the shaft of the bone, and the bone is sawed off.

6. The end of the bone is now carefully trimmed and rounded, the periosteum brought down carefully over the sawed surface of the bone, and carefully sutured by means of a small needle armed with very fine, perfectly sterilized silk.

7. The sheaths of the artery and vein are now carefully dissected up, these vessels exposed, the artery first ligated, then the vein ligated separately, after which a single ligature is thrown around both and tied. The sheaths with the attached connective tissue are then carefully sutured over the ends of these vessels by the same means as were employed in covering the bone.

8. The nerve is now carefully dissected from its connective-tissue attachments, and exposed for two or two and a half inches above the divided muscle, then cut off by means of blunt-pointed scissors. The sheaths and remaining connective tissue are now brought over the ends of the divided muscles, and sutured in a similar way to that adopted in covering bone and vessels.

9. A large compress of iodoform gauze is now folded tightly against the stump, and the skin flaps brought down over the gauze and held firmly and forcibly against the stump in both hands of the operator, when after the lapse of four or five minutes the constrictor

is quickly removed. After the expiration of several more minutes the operator's hands are relaxed, the iodoform gauze tamponade is removed, and the stump carefully inspected, when, if all hemorrhage has ceased and the conditions are favorable for rapid and uninterrupted repair, the flaps are carefully and accurately sutured by means of medium-sized, perfectly sterile silkworm-gut.

10. The wound is now dusted with powdered iodoform, several layers of iodoform gauze brought in contact with the stump, then over this and including the entire leg is placed a heavy layer of absorbent cotton. This is held in position by means of a neatly applied roller bandage.

11. The limb is now placed upon a well-padded posterior splint and another roller made to include this splint and the limb.

12. The patient is then put to bed and the limb kept elevated at an angle of about forty-five degrees.

We are able to show in the clinic to-day the prophylactic flap method of operating in four different cases.

CASE I.—This requires the median abdominal incision. We now divide the skin and connective tissue down to the aponeurosis forming

FIG. 1.



Case I. Illustrating flap operation in ocellotomy.

the left linea semilunaris from a point about two inches to the left of the umbilicus. The incision is carried straight to a point opposite the crest of the pubis. We now reflect the flap by a clean dissection of the subcutaneous connective tissue to a vertical plane immediately beyond the border of the surgical wound we shall have to make to open the abdomen. The flap having been thus reflected and drawn to the right

side, the anatomical landmarks of the underlying borders of the recti with their intervening aponeurosis are beautifully brought before our eyes for inspection, and serve as invaluable guides for the further operative procedures, and I may as well emphasize this feature of the flap method of operating over the old procedure of cutting directly through all of the tissues. The anatomical landmarks, as you know, all lie beneath the skin, and when this is first reflected away from the underlying structures a most decided advantage is gained, as the operator is then enabled to conduct the incision necessary to open the abdomen with unwavering precision. In no part of the body is this advantage more clearly demonstrated than in the operation for hernia, which we will show you in the next case.

CASE II.—Here, as you will observe, after the flap is reflected downward, the muscular fibres and aponeurosis of the external oblique are plainly exposed to view, together with Poupart's ligament and the

FIG. 2.



CASE II. Flap operation for hernia.

external abdominal ring. You see that no difficulty whatever is encountered in finding and isolating the several layers of tissues that lie in the vicinity and go to form this hernia. Note that the flap is reflected downward, and extends from the anterior superior spinous process of the ilium to the pubic bone.

CASE III.—This case may serve to illustrate how the flap is fashioned in operating upon the stomach. But I may say that in exposing the gall-bladder, by first raising a flap of the skin, the landmark which is used as a guide is precisely the same as that used upon

the left side when operating upon the stomach, which I will demonstrate in the operation necessary upon the fourth case; that is, for the purpose of making a cholecystotomy.

FIG. 8.



CASE III. Illustrating flap operation in gastrotomy. Portion of stomach delivered through incision.

CASE IV.—The point of the index finger of the left hand of the operator, as I will now show you, is placed upon the costal end of the tenth rib. This point must determine the middle of the base of the

FIG. 4.



CASE IV. Flap operation in cholecystotomy. Gall-bladder delivered through incision of abdomen.

skin flap. Precisely the same landmark is used in reflecting the flap for the purpose of exposing the stomach upon the left side. You observe after the flap is reflected upon the right side that we come

directly down upon the right linea semilunaris. This line, together with the comparative free end of the tenth rib, are brought prominently before us for inspection. We now place the point of the scalpel immediately below this costal end of the tenth rib, and after transfixing the abdominal wall, carry the incision directly downward for a distance of about two inches. We now separate the lips of the incised wound rather forcibly by means of retractors, and you see the tip of the gall-bladder presenting itself plainly in the centre of the wound. Note the accuracy of the anatomical landmark used to reach the gall-bladder and the ease of reference.

ADVANTAGES OF THE PROPHYLACTIC FLAP METHOD.

As the chief purpose of our clinic to-day is to demonstrate to you the immense value and utility of the prophylactic flap method of operating, I shall not take up any more time in detailing the surgical technique involved in the operations just performed. You now see, however, that when the flap is brought back into its former position and sutured to the skin the cicatrices in the skin will be at a distance from the cicatrices in the underlying tissue. You have no doubt been struck with some amazement at the simplicity with which the dissections in these operative procedures were carried to completion after the subcutaneous tissues were brought directly under inspection by means of the preliminary elevation of a flap. If drainage should *ever be necessary*, a button-hole through the integument may be made away from the suture wound for the drainage-tube. Let me repeat the admonition to practise drainage only when *necessary*, for the promiscuous practice of drainage is a confession of fear or weakness, both of which are unscientific and unfortunate.

I think I can justly claim some originality in the adaptation of the flap method to all surface operations, as well as in the cultivation and extension of its scientific uses. Mr. Horsley pointed out that the custom of removing the soft parts from the cranium by means of a cruciform cut was a method possessing great practical inconvenience, since four distinct flaps have to be held back, requiring as many assisting hands, all very much in the way, so he thought that by raising a semilunar flap it can be simply thrown back, and requires no more holding. This semilunar flap, he insisted, must be so drawn as not to divide the main arterial trunks supplying that portion of the scalp. So that the special reasons that led him to adopt this method were to meet those indications, and also, as he afterwards stated, with the view of preventing hernia cerebri, as well as to serve as a safety-valve to

relieve intra-cranial pressure. John Chiene, M.D., of Glasgow, Scotland, applied the principle of the flap method to general surgery in 1892, but in this country, so far as I am aware, no surgeon has utilized it as a prophylaxis in surgery. I may add that Chiene by his original work has greatly increased the range and utility of the flap, and advanced many new and important suggestions respecting the value of the flap method of operating, but I believe the idea, as I have stated, of the preliminary formation of a flap in a surgical operation upon the surface of the body first occurred to Mr. Victor Horsley, and in fact this man, who has done so much splendid work in cerebral surgery, I believe is justly entitled to the credit of introducing the semilunar or omega form of flap operation to the profession.

The many advantages of the preliminary flap method recognized by both Horsley and Chiene are truly of great value, but the scope of general usefulness of this plan of operating is almost without limitation. I repeat that as a prophylactic measure against infection it possesses advantages that cannot be equalled by any other known plan, but as a prophylaxis against unnatural adhesions between the skin and subjacent tissue, constituting the area of a surgical wound, the plan here practised manifests its most brilliant effects. Look, for example, at the remote effects of a straight cut through the skin immediately over the breach of a transverse fracture of the patella, where the fragments have been operated upon for the purpose of securing direct fixation of these fragments. Here we see a strong, unyielding fibrous union between the two cicatrices, the cicatrices becoming amalgamated, as it were, and there can be no motion of the patella without dragging the skin with it. This circumstance renders motion not only painful, but limited. Impairment of function of the entire knee-joint is an unavoidable consequence, and the weight of the person's body can never be supported upon the bended knee, an unfortunate condition that lasts as long as the individual himself, all resulting from the surgical operation instituted for the relief of the patient, and not from the actual effects of the original injury, as is too frequently charged, for by reflecting the integument from beyond the lower border of the patella upward, when replaced and sutured it will receive the protection of the lower edge of the patella tuberosities and tubercle of the head of the tibia, and none of these vicious sequences can follow. Many of you may be able to recall individuals among your acquaintances who have undergone some years ago an amputation of a limb, and have carried with them stumps that during the years since the amputation have never been free from pain. A painful stump nowadays may be rightly

charged to bad surgery. It could not be said that these cases were due to bad surgery if they occurred some years ago, but in the light of our present knowledge of the essential detail necessary in properly performing an amputation after the manner which I so carefully and fully described to you at the beginning of this lecture, we must feel ourselves that a large share of the responsibility for such consequences must rest upon our own shoulders.

Gynaecology and Obstetrics.

A CASE OF OVARIAN TUMOR.

CLINICAL LECTURE DELIVERED BEFORE THE MANCHESTER CLINICAL SOCIETY.

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GENTLEMEN,—The main object of all clinical lectures, as I understand them, is to reverse the mental attitude of the student who has carefully studied what systematic works on medicine and surgery have to teach, as well as followed with attention the bedside teachings of his instructor. I suppose the majority of you feel very much as I used to after listening to such demonstrations. There was a comfortable feeling that the case *was* so and so, because the lecturer had said it, and we had immense confidence that he could not be mistaken, and we accordingly paid chief attention to anything he had to tell us about the treatment, especially any new treatment, the points of diagnosis being almost taken for granted.

The mental attitude in studying books is similar. The disease is postulated to begin with. Everything that follows is taken upon this hypothesis, and, although the similarity to and differences from other complaints are duly mentioned, there is no *hunting* among possibilities and probabilities. Everything stands out clear and decisive, with a well-defined distinctness which is very refreshing.

Far different is it when you come alone to a perfectly fresh patient not yet labelled, with no teacher, physician, or surgeon near to assist. You realize very keenly that your whole reasoning must be reversed,—that you must begin at the other end, so to speak: and in practice you always have to begin from the other end. Let me warn you, at the start, not to place too much reliance upon what the patient tells you. When you have discovered, as you soon will, that the tale told to-day in answer probably to very leading questions from yourself is wholly inconsistent with that told yesterday in reply to equally leading questions from some one else, and this on some of the most vital points, you will not attach so much importance to every statement as

you would doubtless at first be inclined to do. It is, no doubt, a self-evident truth, since, if you think of it, patients can no more be expected to know what is essential in their case than you could be expected to grasp the important points in an engineering problem. With the greatest desire to tell the truth they will unduly emphasize at one time what they will unduly slur at another. Take the element of pain, for example; if the pain is actually felt at the time, it crowds out of their mind everything else. If it is not, a merciful providence renders it comparatively easily forgotten, or at least minimized, so that a patient will at one time resent any inquiries as to anything but the one which occupies her attention, which she will describe as dreadful, unbearable, agonizing, and at another as a slight attack of colic, which, after all, did not last long, and declare that what she is really mainly suffering from is an undue frequency of micturition with persistent leucorrhœa.

So that, in the majority of instances, your safest guide is your own observation,—the careful noting and comparison of what you can see, feel, hear, and even smell for yourselves; but such observation to be trustworthy must be constantly practised and duly trained, and in the proper interpretation of what you observe you will find the use of what you will have learned from books.

As I have said, I attach the least importance to what the patient herself may tell you; but in order to save time, and also to insure that a patient shall not go unrelieved of the condition she herself considers of most importance, I always commence with one single question.

Of what are you complaining?

Note the answer.

"I have a lump here," pointing to the abdomen.

I always ask all patients to place their hands on the exact region of the body of which they are speaking, and this is necessary, since in ordinary parlance "my stomach" means the entire abdomen, "my back" means anywhere from the upper dorsal vertebræ to the coccyx and between the angles of the ribs on either side.

The next thing is to expose the part.

As you see, this is a very large lump.

Look at the abdomen in the first place, and have it thoroughly exposed. Notice first that the swelling stands forward. Let us then compare it with another patient in the medical ward who also has a very large abdomen. In the medical case you see that, although the abdomen is just as much enlarged,—the circumference, indeed, being two inches more than in our case,—the swelling has a very different look.

In ours the side-lines, looking at the abdomen as she lies on her back, do not bulge out much, the waist is neater, so to speak, whilst in the medical case the side-lines bulge out markedly between the ribs and pelvis. Now, if you bend down so as to get the upper outline of this abdominal swelling between your eye and the wall, you will observe a marked convex curve from the upper to the lower extremity of the abdomen. Look in the same way at the medical case, and you will see that it is nearly flat, raised somewhat centrally, but with a sort of "table-land," as geographers call it, at its upper level. In our case it is a perfectly rounded curve, or, better, a number of curves. There is no flattening at all: it is, as we say, salient. Now, these observations so far prove that, whatever the swelling is composed of in the medical case, it is common to the entire abdominal cavity, and that, therefore, it tends to collect in the lower parts of the space available, following the ordinary laws of gravity; in our case, it is effectually prevented from occupying more than a certain portion of that cavity.

Incidentally, you will see that, whilst a swelling which is common to the entire abdomen must be fluid, this by no means follows in an encysted swelling, which may be fluid or solid, or part one and part the other.

Inspection shows also that the swelling is not in the middle line of the body; that the whole bulk seems to lie across, the main portion below being on the right side of a line drawn down the centre from the sternum to the pubis, the upper portion becoming more central.

Notice also that the swelling is outlined by more or less regular curves, and that these curves are larger below, smaller above; they are arcs of distinctly different circles, the lowest of these being the larger.

So then, from simple inspection, we conclude that this patient has a tumor, using the term in its simplest sense, which is distinct from the general abdominal cavity, and which is not a simple one, but probably double, because of the difference in the curves; also that it probably springs from the right side of the pelvis or some organ on the right side of the body.

Now the next step is to determine the relative position of the intestines to this swelling, and this you do by percussion. If our previous impression is correct, we shall find the intestines displaced, and according as they are displaced upward, backward, forward, or downward we shall be justified in deciding as to the original starting-point in the growth of it.

Starting below on the right side, where apparently this swelling

mainly lies, no clear sound can be found here at all. There is no space between the tumor and the pelvic bones. Follow this upward, and for a long distance the percussion note is as dull as ever, until you get to the level of the ninth rib, where it becomes clear. By this clear percussion note you recognize the presence of intestine,—since all intestine, unless very closely packed, indeed, by *fæces*, contains some air,—and the presence of this in its tube gives the clear note heard. When this point is found, it is well to mark it with an aniline pencil, which leaves a mark not easily erased, so that you are able to compare the mark made to-day, which defines the limit of the tumor in this direction, with that made a week ago, or that made next week, and thereby discover both the rate of growth and the possibility of autonomous movement possessed by it. This also can be judged by the history and more readily, but I wish to show you how much information can be gained by your own observation. Then follow this clear sound around the body, marking the line where clear sound begins and the dull ends, going always from the dull sound towards the clear, and you will be able to map out both the size and position of the growth. When you reach the lumbar region on each side, you find first a clear sound behind the main dulness, and a little farther back a dull sound again. This is obtained on both sides while the patient lies on her back. Turn her onto one side and wait for a minute. The uppermost flank is now quite clear, whilst the clear sound seems to have disappeared from that which is now undermost. In turning the patient, you will have noticed, too, a very curious condition. You could see, if you looked closely, a fine ripple, as of fluid passing across the abdomen just at the junction of the upper with the lower mass. Now both these observations mean the same thing. Besides the fluid, if it is fluid, enclosed in the tumor, there is some free or ascitic fluid in the general cavity, which lies over the lowest level of the abdominal cavity, gravitating into the flanks when the patient is lying, and changing its position when the patient alters hers. This fluid cannot be in great quantity, as it flows so easily, even though the main cavity is so thoroughly filled by the tumor, therefore it is probably simply due to pressure or the slight irritation caused by the presence of so large a growth. It is probably not due to malignancy.

But the last observation tells us something more. It shows us that there exists a valley on the surface of the main swelling, along which this fluid runs like a river in its bed. If this tumor were single, there would be no valley; if it were double, each tumor being separate, it would trickle between their surfaces below and out of sight. Our

tumor, therefore, must be multilocular, composed at least of two main but connected masses.

Now I want you to compare this condition with that of the patient in the next bed. Here is a young woman with a swollen abdomen, an abdomen which is prominent, with no table-land above, with swellings whose curves have different arcs, with clear percussion-note above and in the flanks, whilst the central and most prominent bosses have a dull note. Do you notice any difference? Percuss both carefully. In our original case, you will find that you have no difficulty in saying that at a given line dulness suddenly and definitely ends and a clear note begins. In this last case, can you say so? The dulness seems to shade off, but has no clear outline, and any three of you attempting to outline it will almost certainly give three altogether different outlines, whilst the patient remains motionless.

Consequently we arrive at the conclusion that the material contained in the swelling in our first case is limited by a definite membrane, not, as in the second, merely arrested by adhesions around it, and that it is multilocular.

Now comes in a bit of knowledge which you get from books, and which takes you a step further. Multilocular tumors are usually ovarian. An enlarged gall-bladder, supposing it possible that it could reach this size, could not be anything but single, moreover the clear sound would be below. Liver tumors would be dull above and clear below. They, too, would be single. Kidney tumors would be single. The dulness, moreover, would extend into one or other flank, and the clear sounds would be above, below, and on the opposite side of the abdomen. Splenic tumors are single, and the dulness is continuous with the left hypochondrium. Omental tumors are clear below and above. Mesenteric tumors are generally clear in patches, since they push the bowel upward against the abdominal wall in front of them. Uterine tumors are more central, but may be lateral and more than one in number. Besides, as in our case, the clear sounds would be above and on either side. Really, then, we can narrow this question down, you see, to two kinds of tumor,—ovarian and uterine.

To settle this we have resort to a method known as bimanual palpation; this means, as its name implies, the use of two hands, or rather the use of one or two fingers of one hand passed into the vagina or rectum, and one hand placed outside over the abdomen. It is well to get into the habit of using one hand always in the same way, and for several reasons the fingers of the left hand are best used internally. In unmarried women always pass them into the

rectum, which should be cleared by an enema beforehand; in men, of course, it is the only available route. In married women, usually the vagina is utilized. Now, as almost all tumors lie between the finger in the rectum and the hand on the outside, you will see that by using the left hand internally, the finger-pulp, the most sensitive part of the finger, is turned towards the tumor when the patient lies in the usual Sims position, or in the dorsal-lithotomy position, and is naturally opposed to the finger-tips and palm and surface of the right hand laid on the abdomen, so that anything lying between can be grasped, or at least palpated to the greatest advantage. The right hand should be passed between the legs of the woman, and placed flatly and without any force whatever upon the abdominal wall. When your hands are in position, wait a moment with both firmly but very gently applied. Always at first there is some muscular tension in the recti muscles, which effectually prevents our obtaining any information whatever. After a few seconds, however, you will feel this rigid surface becoming more supple, and if then, still keeping your external hand flat, you begin to give the fingers and, indeed, the whole hand a vermicular movement, pressing slightly and always gently, first with one finger, then with another, now with the thenar, then with the hypothenar eminence, you will find that the wall, which at first felt like a board, soon begins to feel like a thick blanket, then a thinner and thinner one, until at last, if you are patient enough, the whole abdominal wall feels much like a linen sheet covering the organs you want to examine. Now try to bring the finger-tips of both hands together, always in the same, slow, gentle, vermicular fashion, and you will be most likely to succeed first in the region of the bladder just above the pubes. You will be likely to be surprised to find that your external finger-tips are much too high, but practice will show you soon where to expect them. When once your fingers have found one another, it is wise to allow them to keep company, passing gently from side to side of the pelvis together, separating as the uterus, broad ligaments, tubes, ovaries, etc., come in their way, estimating by the separation they cause their size, consistence, position, etc. Throughout all never dig the fingers in, or allow them to make sudden jerks. If they become tired, rest, and try again next day. Tired muscles are not under control, and their sense of resistance in judging of size, etc., is not to be relied upon. Moreover, you will find that an abdomen that has once been manipulated in this way never again opposes quite as much resistance as it did before, and with patience you are bound to win. The only abdomen which is

really hopeless is an extremely fat one, where the layer of subcutaneous fat is from one to two inches in thickness. With such an abdomen it is best to anæsthetize the patient, and then you find matters much easier. But persons with abdominal tumors rarely are fat, and therefore such difficulties do not so often arise. It is a good rule not to be ever on the outlook for extraordinary cases and extraordinary difficulties. The great majority of cases are quite manageable by the means I have pointed out, and there is nothing so galling as to find another man quite easily diagnose a case which you have just declared to be one of these extraordinary rarities, and quite impossible.

In this particular case, of course, the fingers will not come together, but there are several things to be noted by their use, all the same. As your finger passes up the vagina, it seeks for the main landmark,—the os uteri; at first you cannot find it, and yet it is there, pulled up above and behind the pubis, and it requires some little searching to find it. Behind it is a soft bulging mass, formed apparently by the posterior vaginal wall. What can this be? The rectum lies immediately behind this wall. Can it be a greatly dilated rectum full of fluid? The easiest way to settle this is to pass one finger of the left hand into the rectum, and the similar finger of the right hand into the vagina, and palpate the wall between. Now you will feel that the bulge lies between the two, and that it is easily pushed up out of the way,—notice that it is *pushed* up as a whole, your fingers do not sink into it as they would if it were free fluid,—only to sink again as soon as your pressure is removed. So the mass, whatever it is, is between the rectal and vaginal walls, in the pouch of Douglas, as it is called.

If the uterus were retroflexed, we might find a similar state of things: the os uteri being carried up and to the front of the vagina, whilst a mass which was movable upward appeared to lie in the pouch of Douglas. This might be distinguished by passing a sound into the uterine canal, and noticing whether as it passed onward it dipped backward and could be felt to enter this mass; but the latest and best teaching inculcates a wholesome dread of this instrument, which is without doubt one of the causes of pelvic inflammation, and, if you learn to use your hands, you will find it generally unnecessary. In the present case, whilst your left forefinger is pressed against the bulging mass, tap with your right hand the tumor from its abdominal aspect and in its lower segment. A distinct thrill is conveyed to the vaginal finger, which with practice will be recognized as the thrill of some very thin liquid. It is only by long practice that you become in

time able to distinguish between the thrill of fluid like water and that of thick glutinous material, like jelly. If you tap the upper segment, you will find only a very faint thrill passing through the vaginal finger. This shows that if there is any opening between the upper and lower mass, it is but a small one. Now if this bulging in Douglas's pouch were the fundus of a retroflexed uterus, you would find no such thrill, and, besides, it would not give your left forefinger the elastic sensation this does; it would be that of a solid body, which might or might not be movable, but would certainly be much harder or firmer.

If you will bring your outer hand farther down towards and just above the pubes,—and here let me caution you not to take the hand off one spot and put it down again on another, but move it gently and slowly in the direction you wish next to examine,—you will find, I think, with a little patience, that you can feel the uterus or the upper end of it just behind the bone. You will discover a little to the left of the middle line something which is firm, rounded, and projecting slightly against the abdominal wall. Why do I know this to be the uterus? First, from its position. If not retroflexed, and we know now that it is not, a uterus the os of which is carried up so high and to the front as this is must project slightly above the pubes in much this position. Second, because, when I press with one hand on the little firm mass above, I feel the force of my pressure conveyed directly to my finger placed against the os below. Third, because I recognize what probably you do not yet, but will with practice, the shape, size, and outline of a uterine fundus.

Now let us gather up the various bits of information which we have gained, as you see, by inspection, percussion, and palpation, with no help from questioning the patient, except the one initial inquiry, and piece them together; you will find, I think, that we know pretty well already what we have to deal with.

The patient has an enlarged abdomen.

This enlargement is mainly due to a collection of fluid, which is encysted.

This collection is not merely banked up by adherent intestine, but is a true cyst.

It is not a simple cyst, but consists of at least two masses, of which the largest is below and to the right.

There is also a small amount of free fluid in the abdominal cavity.

This tumor does not spring from any organ in the abdomen proper.

It is not hepatic, renal, splenic, mesenteric, or omental.

It appears to spring from some structure on the right side of the uterus.

It does not spring from the uterus itself.

Now, there are but three sources for a tumor such as this situated on the side of the uterus.

1. *The broad ligament*, which gives origin to parovarian and dermoid cysts. Parovarian cysts are always single. This is therefore evidently not parovarian. Dermoid cysts are firm, or firm at one point, thin at another. This contains no firm masses. This cyst is not a dermoid. Therefore it does not spring from the broad ligament.

2. *The Fallopian Tube*.—Long before a Fallopian tube had reached this size it would have given way. A true cyst springing from the Fallopian tube is always small. It does not spring from the Fallopian tube.

3. *The Ovary*.—Ovarian cysts are often multilocular, and frequently, if undisturbed, reach this size. In their growth they press the uterus up in front of them, just as this has done. They press the intestines upward and to the sides, in the manner found here. They are sometimes associated with free fluid in the peritoneum. So that both by exclusion and by direct characteristics we conclude that this is a multilocular ovarian cyst, springing from the right ovary.

Now, you know that when you were at school, and had done a sum in arithmetic, you were often asked to prove it. There are two ways of proving this solution of our abdominal problem. The most certain is by operation, but if we should be wrong, it is also the most risky for our patient: but there is another way, and that is by seeing whether her history corresponds with the usual history of such a cyst. Of course, you expect every individual case to differ slightly from the type, but the general account should tally.

To Patient.—When did you first notice this swelling?

Patient.—About two years ago.

Where did you feel it first?

Patient.—On the right side. It was then only a small lump.

Had you any pain?

Patient.—No, not until lately. Two months ago I had an illness, and a good deal of pain and sickness. I was in bed for three weeks.

Surgeon, to Class.—That probably means localized peritonitis, which frequently occurs during the evolution of such a tumor. We shall most likely find adhesions consequent upon this.

To Patient.—Are you married?

Patient.—Yes.

Any children?

Patient.—Yes,—six.

How old are you?

Patient.—Forty-nine.

How old is the youngest child?

Patient.—Ten years.

Are you quite regular?

Patient.—No, I ceased to be unwell when I was forty. I was always regular before.

Have you lost flesh?

Patient.—Yes, for the last two years.

Let us see your chest.

To Students.—You will notice that she has been gradually losing flesh for two years. If that had been due to malignant disease, she would have been dead or dying by this time, and instead she looks in fair health. Look at the chest. You see that the main emaciation is there,—the chest bones being more prominent than those of the face or legs, and this is characteristic of ovarian tumor.

To Patient.—Have your legs swelled?

Patient.—Yes, ever since last Christmas. They are better just now, but I have been resting.

This fixes fairly well the date when pressure symptoms commenced. Of course the swelling is due to pressure on the iliac veins and vena cava within the abdomen.

Now I want you to go over the evidence again, and see if we have left any weak places; because I find myself that often, after getting a satisfactory result in any one case, the thought occurs, "Yes, I see that quite plainly, and no doubt that is correct, but we had one or two points to guide us in this case, which may not occur in another, and then where should we be?" For instance, in this case we found free fluid in the peritoneum, which, trickling over the surface of the tumor, not only showed us that the main bulk was encysted but that our tumor was multilocular. Suppose there had been no free peritoneal fluid? Well, that would have made the clear spaces in the flanks clearer still, and the lateral outlines still more defined. The tumor would have been just as salient, and the unequal swelling of the two sides more pronounced, so that our diagnosis of an encysted swelling would have been as easy as before. Then as to the multiple nature of the cyst, the difference in the arcs of the various circles would have suggested this, and careful palpation would have probably rendered it certain.

You will remember also that we felt the uterus just above the pubes. Why did we, therefore, come to the conclusion that the growth did not spring from it? Here, again, the experience gained from books is useful. Cystic growths of the uterus enlarge it as a whole; they usually spring from or at least involve the fundus. Here the fundus was normal in size and shape, and was evidently not involved.

Suppose the fundus had not been felt? In such a case you have always the sound to fall back upon, and if, after passing this, you find a uterine canal of normal length, or not enlarged more than half an inch, you may be certain that your growth—a growth of this size—is not uterine.

Suppose the growth were smaller? Then the uterus would have been felt with fair ease: certainly under an anæsthetic it could have been readily mapped out by bimanual palpation.

As to the treatment. Will medicine do anything for her? No, an ovarian tumor is not controlled by any known drug.

What remains? Doing nothing; tapping and extirpation by laparotomy.

If we leave her alone, what will happen? Forty years ago it was considered reprehensible to operate, and writers of that date have given us a graphic picture of the natural history of an ovarian cyst. I will summarize what Dr. West and Mr. Hutchinson have written about these cases.

Three out of four died within five years from first appearance.

Pressure symptoms appeared in two or three years.

Dyspnœa, dyspepsia, obstinate constipation, frequent and painful micturition, diminished secretion of urine, obstinate vomiting not relieved by any medicine, becoming sometimes stercoraceous.

Gradually increasing weakness. Utter weariness and sleeplessness.

Efforts necessary for cleanliness and comfort become impossible.

Bedsore.

The mind remaining clear, the patient watches the rapid approach of death, at first with dread, later welcoming it as a release from insupportable misery.

Anything would appear to be preferable to this.

Tapping.—The cyst, unless it be parovarian, will inevitably refill, and at shorter and shorter intervals.

At each tapping, unless you completely empty the cyst, and make your opening at a high point relatively to the entire mass, it will leak into the general peritoneal cavity. As the fluid is sometimes irri-

tating, it may set up acute peritonitis, or, escaping from a papillomatous cyst, it may start papillomatous disease of the peritoneum, which is equally fatal, although it takes a slightly longer time to bring about this result. Air may enter the cyst through the trocar, carrying with it pyogenic germs, and convert the tumor into a huge abscess, with its attendant dangers of septicæmia and pyæmia.

Lastly, when you and your patient are tired of the repeated punctures, should you decide on laparotomy, you will find that each tapping has been followed by an adhesion more or less vascular, and that in consequence the extirpation is rendered so much the more prolonged, difficult, and therefore dangerous.

The objections against, therefore, absolutely outweigh the apparent advantages of this method.

Cœliotomy is therefore the only method worthy of consideration, and this should be performed, if possible, as soon as the diagnosis has been clearly made out; and always, if possible, before pressure symptoms set in, partly because the prognosis after operation is much better, and partly because the course of the complaint becomes greatly accelerated from that point onward.

[The operation was performed, and the previous diagnosis confirmed.]

UTERINE FIBROIDS.

CLINICAL LECTURE DELIVERED AT THE JEFFERSON HOSPITAL.

BY E. E. MONTGOMERY, M.D.,

Professor of Clinical Gynæcology in the Jefferson Medical College; Gynæcologist to Jefferson and St. Joseph's Hospitals; President of the Alumni Association of Jefferson Medical College, Philadelphia, Pennsylvania.

GENTLEMEN,—This patient, thirty-one years of age, with a negative family history, enjoyed good health until her present illness. She had the ordinary diseases of childhood,—diphtheria at eleven, enteric fever at eighteen, and malaria at twenty. Puberty was established at twelve, the periods lasting three or four days, preceded by pain just before the onset of the flow. She was married at sixteen and one-half, and has had three pregnancies, in all of which she was delivered at full term. The last occurred sixteen years since. After the birth of the last child she suffered from an attack of menorrhagia, which lasted ten days. Following which she has complained of constant frontal and occipital headache associated with pain in the pelvis and a feeling of fulness and bearing down in the inguinal and hypogastric regions. Pain in the back and limbs at times is very severe; the latter are painfully swollen. She suffers from frequent micturition, from dyspnoea, made worse by exercise, general malaise, and lassitude, with disinclination to exercise. She feels tired upon arising. She has a slight œdema, an irritable bladder, constipated bowels, while her appetite and digestion are fairly good. At present she has an excessive menstruation which lasts ten days and is very profuse. She is menstruating now. I bring her before you, not for an examination, but to let you see the appearance of her face and show you the marked indications of loss of blood, showing there is some condition either of deficient nutrition or of marked wasting. As she gives a history of excessive menstruation it is quite probable the latter is the cause of her anæmia. Examination has disclosed the cause of this loss of blood to be a growth which is irregular and can be seen through the abdominal walls. This

growth is a fibroid tumor of the uterus. As I have frequently told you, hemorrhage is a symptom. When it occurs at menstruation it is known as menorrhagia. It may be indicative of a variety of conditions and should always be a signal that should lead the physician to carefully examine for its cause. No patient should be permitted to go for a length of time without a thorough exploration to ascertain the cause of the hemorrhagic condition. Do not make the mistake of attributing it to some slight local condition or to the change of life. If hemorrhage occurs at the menstrual period, even though it may be near the climacteric, careful examination should be made, for not unfrequently at this period of life it originates from degenerative processes, in which relief can only be obtained by early resort to operative procedures; if you permit your patient to go for some time without subjecting her to treatment, you are doing yourself and her an injury. It is far better to resign the case when the patient is unwilling to submit to examination and let some one else have the responsibility rather than to continue treatment upon symptoms alone, for you are permitting the possibility of development of degenerative processes that will have passed over the line at which successful treatment can be instituted, when you finally secure permission to attempt it.

Hemorrhage may arise as a result of a variety of conditions. It is caused by disease of the endometrium, in which inflammation of the lining membrane leads to distention of the vessels, the circulation is interfered with, papillary growths arise upon the surface, and increase the tendency to hemorrhage, either in the menstrual intervals or at the time of menstruation. The retention within the cavity of the uterus of parts of embryonic life, a portion of the placenta, or membranes after abortion may lead to excessive and continuous bleeding. Retro-displacements of the uterus shortly after delivery cause hemorrhage. When a patient suffers from bleeding two or three weeks after her delivery, by all means examine and keep in mind the possibility of its having originated from retroversion and retrodisplacement. Growths within the wall of the uterus, projecting into its cavity, interfere with the circulation, and are generally associated with bleeding. These growths may be benign, such as fibroid tumors, or malignant, as epithelioma, sarcoma, and carcinoma. It should not be forgotten that hemorrhage may arise from diseased conditions outside the uterus, in its immediate vicinity. It may be produced by the presence of inflammation or an exudation situated in the broad ligaments, the presence of an ovarian or broad-ligament cyst, or an ectopic gestation. In such cases the return circulation through the veins is ob-

structed. It should not be forgotten that it may arise from the presence of a fecundated ovum in the uterus, the hemorrhage a result of increased congestion and an indication of threatened abortion. A number of cases have come under my observation in which excessive menstrual flow was accepted by the patient as an indication that pregnancy existed and would continue probably during the first two, three, or even four periods subsequent to the conception. We would not expect to find malignant disease in a woman thirty-one years of age, yet it is important to keep in mind its possibility, as cancer occurs in women at any age, and the younger the woman the more rapid the progress of the disease.

Hemorrhage may arise as a result of constitutional diseases; from depraved nutrition; thus, it is not an infrequent sequel of anæmia and greatly aggravates it. It may sometimes be a preliminary indication of zymotic disease; cases of typhoid fever occur in which hemorrhage is so marked as to lead the physician to believe that it is caused by some local trouble. Diseases of the kidneys, of the liver, and of the heart not unfrequently produce uterine hemorrhage. It is due to obstruction of the systemic circulation. Consequently, where we have hemorrhage as a symptom, the various possibilities of its production should be kept in mind, and a careful examination and analysis of the patient's symptoms will exclude one after another of these conditions until we have ascertained the exact cause. We should not omit to refer to the diseased condition of the ovaries as a cause of hemorrhage. Thus, in chronic ovaritis accompanied with formation of some cysts, hemorrhage is a frequent symptom, and in some cases only relieved by the removal of these organs. Ovarian hyperæmia is one of the most frequent causes of hemorrhage in early menstrual life, and if the condition is neglected, results in chronic inflammation of the ovaries. In this patient we are able to eliminate by examination the probability of this hemorrhage arising from any other cause than a local one. There is a growth within the uterus which is perceptible through the abdominal walls, and this growth is undoubtedly the cause of the hemorrhage. Growths within the uterus are usually of one kind. They develop in the organ itself, due to a localized inflammation and hypertrophy. These growths are classified according to the situation. Thus, one in its origin of development, situated near to the mucous membrane, as it subsequently increases in size is projected into the cavity and pushes before it the mucous membrane. One situated near the outer wall would be projected beneath the peritoneum, becoming what is known as a subperitoneal as contradistinguished from one beneath the mucous

membrane, which is known as a submucous tumor. Other tumors, possibly equally distinct between the two walls, increase in size and project internally and externally, become known as interstitial tumors. We may have the entire organ well taken up by the growths, some of which may be subperitoneal, others submucous, the majority interstitial. The submucous growths are most likely to be accompanied by hemorrhage, as they interfere with the circulation in the mucous membrane in the greatest degree. The pressure of a growth upon the mucous membrane leads to enlargement of the vessels to such a degree that their muscular coat is paralyzed, and when the vessel ruptures it has no contractile power to arrest the bleeding. These vessels are sometimes seen to rupture only on one side; when the vessel is cut through, hemorrhage is arrested. These growths, as they increase in size, in addition to the influence upon the circulation of the organ, give rise to more or less distress and discomfort from pressure upon the surrounding organs and upon the pelvic contents. As the tumor increases in size sufficiently to fill up the pelvis it presses upon the rectum and bladder, upon the ureters, and keeps the patient in torment until it attains sufficient size or is pushed out of the pelvis and rests upon the pelvic brim. Such patients will suffer from congestion about the anus, due to the pressure, to the formation of hemorrhoids, fissures, and from rectal bleeding. Pressure of the tumor upon one or both ureters will give rise to hydronephrosis, to continuous pain in the region of the kidney, and to an influence upon the health of the individual which would arise from such a condition. The kidneys have been seen in old tumors in a state of sacculation as a result of the pressure upon the ureters. It has been my misfortune to operate upon cases in which the kidneys were so destroyed that only sufficient kidney structure was found to carry the patient along when conditions were undisturbed, but the mere administration of an anæsthetic was too heavy a burden for the afflicted organs.

A woman with a fibroid tumor which causes marked hemorrhage presents, as does this patient, a condition of profound anæmia, a straw-colored appearance of the skin, leading one to believe she is suffering from malignant disease. The symptom itself is sufficient to indicate the necessity for an operative procedure, and it becomes a question of importance to decide as to its character. This can only be determined, of course, by careful examination. If the tumor is found to be already dilating the cervix, and is partially extruded from the cavity of the uterus, the indication should be the further enlargement of the cervical opening, the enucleation and removal of the growth. A tumor that

has become separated and hangs only by a pedicle is known as a fibroid polypus. Such a growth may be seized with a strong pair of vulsellum forceps and rotated upon its axis until the pedicle is twisted off and the tumor can then be delivered by traction. The delivery of such a mass is sometimes attended with considerable difficulty, and may necessitate the incision of the cervix on either side in order to permit of its dilatation. If this operative procedure is done, the removal of the growth should be followed by packing the cavity of the uterus with gauze, and suturing the incised cervix.

Many physicians are in the habit of resorting to medicinal measures rather than surgical for the relief of the patient. The most active medicinal measures are such remedies as bring about a contraction of the uterus, cutting off the supply of blood to it. Of these, the most effective is ergot. It acts by increasing the contraction of the muscular coat of the vessels and stimulating the contraction of the uterine walls, thus having a double effect. It may be given by the mouth, by the rectum, in the form of suppositories, or by hypodermic injections. If hypodermic injections are used, care should be exercised that the remedy is free from micro-organisms; it should be given with a clean instrument, and the needle should be inserted deeply into the tissues, preferably over the abdomen. These injections may be given two or three times a week. The administration of ergot by stimulating the contraction of the uterus facilitates the extrusion of the mass into the uterine cavity or vagina and the dilatation of the cervix. Extrusion into the vagina may be facilitated by dilating the cervix or by making lateral incision. In the internal administration of the drug, a very good combination is to give an ounce of fluid extract of ergot in combination with a half ounce each of fluid extract hamamelis and tincture of cinnamon. Of this a drachm may be given three or four times a day, or every two or three hours, if necessary, to control hemorrhage. In many patients ergot produces such a disordered condition of the stomach that it cannot be continued any length of time. Where the tumor is situated high up in the uterus, the cervix is undilated, and the walls of the uterus have undergone considerable fibroid change, it becomes a serious question as to what shall be the method of procedure. Where it is evident the uterus is pretty well destroyed, the patient suffering from constant attacks of hemorrhage, and life endangered thereby, it is necessary we should proceed to operative interference. The preferable operation in such cases would be the extirpation of the uterus. Of course palliative operations may be done, such as ligation of the uterine arteries through the vaginal incisions, as suggested by

Martin; ligation of the ovarian and upper part of the utero-ovarian anastomosis, as advised by Robinson. Such cases of hemorrhage were formerly treated by castration, bringing about an artificial menopause. It was found, however, that the operation did not always arrest the hemorrhage or decrease the growth. In such cases failure was attributed to the fact that ligation had not been sufficiently deep to secure the ovarian arteries. It was recommended that the ligature of the ligaments should be applied in such a way as to include the round ligament, thus making sure the ovarian artery was secured.

Many fibroids, particularly where the tumor is impacted in the pelvis and is not too large, may be removed through the vagina. If the growths are small, they may be removed by the method of Péan, by securing the vessels in the broad ligament on either side by forceps. The size of the mass may be reduced by enucleating or taking out the smaller growths, or by morcellement, which consists in cutting away the mass piecemeal, taking care, of course, that the ureter and bladder anteriorly are not injured. This procedure is as efficient and, in many respects, more desirable than by the abdominal procedure. The clamp forceps are permitted to remain on the vessels for twenty-four to forty-eight hours; indeed, in these cases it seems to me preferable that the forceps should be permitted to remain on longer than in ordinary cases, for the reason that the growth has increased the size of the vessels, and there is consequently more danger of hemorrhage. Where it is necessary to open the abdomen, the tumor is removed through the abdominal incision. This operation is one which has been frequently performed, and has led to much discussion as to its proper technique. The earlier operators were in the habit of leaving a portion of the cervix as a pedicle. This was either secured by ligature or clamp externally, and known as the extraperitoneal method of treatment. Those cases in which the pedicle was ligated internally did badly, for the reason that the uterine tissue is erectile, and the outer portion of the stump, becoming anæmic, would shrink, permitting the ligature to slip, and hemorrhage to result. The consequence was the frequency of internal hemorrhage led to the consideration of the intraperitoneal treatment of the pedicle as a dangerous one. Of late, through the experiments of Eastman, Baer, Goffe, and others, the excision has been made low down in the cervix, the uterine arteries ligated upon either side. Two ligatures upon either side are sufficient, one for the ovarian and the other for the uterine artery. Eastman of late has resorted to a ligature for the ovarian, and then has subsequently pushed off the uterine artery, tearing the small branches by which the uterus is supplied, and re-

moving the entire organ without second ligature. The procedure, however, is a slow one. The complete extirpation of the uterus with the removal of a small portion of the cervix, where readily performed, is the preferable procedure. The plan of operation is similar to that already discussed, with the exception that the opening is made into the vagina posteriorly, and the cervix separated from the vagina and removed entire. Both these operations, of course, should be preceded by thorough vaginal asepsis. After the organ is removed, the cavity may be packed with iodoform, the end of it projecting into the vagina and the peritoneum stitched over this, shutting the gauze outside the peritoneal cavity. The abdominal wound is then closed entire. The advantage of this over the extra-uterine method of treatment is that the convalescence is much more rapid, the patient is less likely to have a weakened ventrum, and subsequent ventral hernia. There is an absence of the traction upon the vagina and uncomfortable pressure upon the bladder, and the patient is deprived of nothing that is of any special value. The believers in electricity condemn the resort to the knife in fibroid growths, claiming that they may be treated by means of electrical applications, and with less danger to the patient. For hemorrhage, the intra-uterine use of the positive current is beneficial, but it is only temporary in its effects. Its discontinuance leads to redevelopment of the diseased condition, and the return of hemorrhage is as severe as before, and it is a question whether the electrolytic action is as effective as would be curetting and packing of the uterus; it certainly is equally dangerous.

HEMORRHAGIC METRITIS.

CLINICAL LECTURE DELIVERED AT THE SUFFOLK DISPENSARY.

BY CHARLES GREENE CUMSTON, B.M.S., M.D.,

Instructor in Clinical Gynæcology, Tuft's College, Boston ; Member of the Société Française d'Electrothérapie, etc.

GENTLEMEN,—The patient that I have taken for to-day's clinic presents a form of uterine disease which is of importance to you, as it is met with frequently, and you should be familiar with its symptoms and treatment ; consequently, I shall discuss the etiology, pathology, and treatment, with the hope that I shall make the subject clear to you.

The patient's history is briefly as follows : She is thirty-six years of age, and works in a box-factory. Menstruation appeared at the age of fourteen, and was and has always been regular, although attended by some pain during the first twenty-four hours.

Married at twenty-eight, our patient has had two normal labors at term, the last one two years ago. Both children are living and well.

Without any known cause, and I have carefully looked for syphilis and gonorrhœa with a negative result, the patient aborted at three months. This miscarriage was followed by a uterine hemorrhage, and she kept her bed for three weeks. Since then she has been subject to metrorrhagia, which is very profuse, with clots, lasting ten or more days, and occurring every three and lately every two weeks. The quantity of blood passed is very considerable, and has produced an advanced anæmic condition, so much so that she has been obliged to give up work.

By bimanual examination I find an enlarged and slightly tender uterus in physiological antiversion.

The adnexa appear normal, and no pain is experienced by the patient when I press upon them. There is an incomplete left-sided laceration of the cervix, the latter being somewhat enlarged and rather hard to the touch.

By the speculum you will notice that the cervix is free from erosions or ulceration.

The principal symptom in this case is the metrorrhagia, and from the history and examination I make a diagnosis of hemorrhagic metritis or metritis post abortum.

In this type of metritis the metrorrhagia is the all-important symptom on which to base your diagnosis. By questioning your patient you will obtain a history similar to this. She will tell you that the abortion was accompanied by a severe loss of blood containing clots. The ovum expelled, this very abundant flooding, which lasts for some hours, diminishes in quantity, but a bloody discharge is present for eight or ten days.

The patient remains in bed during this time, and with or without treatment the hemorrhage finally completely ceases and everything appears to be normal, when two or three weeks later, sometimes sooner, rarely longer, a new hemorrhage makes its appearance.

The patient thinks that this is the return of her menses, but it is nothing of the kind. Instead of coming on at the normal time, it appears several weeks too soon, and is a very abundant flooding *containing clots*. Its duration, moreover, is from eight to twelve days. It is thus plainly seen that this flooding in no way presents the characters of the menses, such as occurred before her pregnancy.

The flow finally stops, but a repetition of the hemorrhage will occur in two weeks or even less.

Now, gentlemen, from this time on you may be certain that a hemorrhagic metritis is present. The patient is continually losing blood, and the flow will finally be present as much as twenty days out of each month. The menstrual periods can no longer be determined, and there are even cases in which the hemorrhage will only disappear for a few days, and I have seen patients that are continually flowing, with only variations in the quantity of blood.

When the affection has reached this condition menorrhagia can no longer be distinguished from metrorrhagia, and in reality the latter term is the more exact when applied to the condition under consideration. This metrorrhagia is generally accompanied by clots during the first few days, or simply the first few hours of the flow. In those patients who never entirely cease flooding, the moments of increase in quantity are announced by the reappearance of the clots. In other cases only liquid blood is lost, but the quantity is greater during the first few days.

However, this clinical description may present a number of varia-

tions. For example, you may have to do with a metrorrhagia in which there is a continual discharge of clots, meriting the term of metrorrhagia more from its quantity than from its duration. The clots may also mark the end of the flow instead of the commencement.

Generally speaking, hemorrhagic metritis is not painful, and if so, the pain is only present when clots are being expelled, and ceases as soon as this is accomplished. As in all other diseases there are exceptions to the rule, and pains similar to those occurring in other types of metritis are occasionally met with in the hemorrhagic form, although in less intensity.

The patient will be more likely to complain of a sensation of weight in the pelvis; she *feels her uterus*, so to speak, and this painful symptom is particularly noted in the median line. In some cases the pains are those of painful metritis, and are seated in the pelvis, kidneys, and internal aspect of the thighs, with irradiations through the rectum, bladder, and abdomino-genital nerves.

Between the periods of metrorrhagia, leucorrhœa is frequently present. It is usually of a whitish-yellow color, rather thick, and comes from the uterus, while the gelatinous leucorrhœa of the cervix is rarely met with in these cases, because the lesions are seated in the corpus and not in the cervix.

By digital examination the cervix will be found enlarged, although not greatly, as in the case I have shown you, while the uterus is larger than normal, and movable, usually without tenderness. The adnexa, if not previously diseased, will be found normal, and will remain so.

By the speculum the cervix is seen in a state of hypertrophy, thus participating in the enlargement of the corpus. It is healthy, but if you find granulations, ulcerations, or ectropion of the lips, it is more than probable that these lesions have been produced by a former cervicitis.

As you see, the diagnosis of this type of metritis is readily made. You will base it on the history of the case as well as by the absence of a fibroid tumor or affections of the adnexa which give rise to metrorrhagia.

When you find by digital and bimanual examination, as well as by a careful palpation, that the uterus is slightly hypertrophied, that the cul-de-sacs are normal, and still more, that the patient attributes the trouble to a miscarriage, no doubt should remain in your minds as to the nature of the affection.

A fibroid polypus could not cause a mistake, for it is usually detected easily through the half-dilated and patulous cervical canal. On

the other hand, more difficulty is presented by a mucous polypus, and by a kind of polypus to which Mayer has given the name of deciduom, which has its starting-point in the remains of the decidua. But the latter is a complication of hemorrhagic metritis rather than a different affection.

The same thing may be said for the neoplasms described by Saenger, which are almost entirely made up of large decidual cells, and which are in reality a kind of sarcoma. But these are complications of metritis post abortum, and the diagnosis can only be made when the neoplasm has attained a considerable size. If they should be present along with a hemorrhagic metritis, it would be far more important for you to make a differential diagnosis of the other varieties of mucous polypi, so that when you have removed them their ablation may be followed by a curettement of the uterine cavity, thus curing the hemorrhagic metritis.

The progress of hemorrhagic metritis does not tend towards cure, and neither does it generally incline towards aggravation. The patients, as in our case of to-day, become weak after a longer or shorter length of time from the repeated loss of blood. They become decidedly anæmic, and in this condition their organism is less resistant against other intercurrent maladies, and it is really most astonishing how many women afflicted with this condition will go on for months and even years without their life being in serious danger.

The prognosis is, however, relatively serious, because the metrorrhagiæ render the patient so weak that she is, in most cases, obliged to give up work. The flooding forces her to remain in bed at least several days out of each month, while the rest of the time anæmia is so marked that she has not the vitality to attend to her duties.

As to the pathology, this type of metritis is usually *interstitial* or *mixed*, that is to say, both glandular and interstitial, but with a predominance of lesions in the stroma. The hemorrhagic metritis of old age is the purely interstitial variety, while in young women the stroma presents the most marked lesions, but the glands do not completely disappear.

There is a great vascular proliferation in the type under consideration. The newly-formed vessels, which are only capillary, are most irregular and of relatively large calibre. They are generally very superficially situated at the free surface of the endometrium, while the greater part of the culs-de-sac of the glands are situated below them. You see, gentlemen, that the hemorrhages can be accounted for by the number and situations of these newly-formed vessels, which are the characteristic lesions of hemorrhagic metritis.

Now, as I have remarked, in the *post-abortion metritis* the principal lesions are to be found in the stroma, while the glandular structures only become affected after a certain time.

A few words now regarding the formation and transformation of the decidua, which will refresh your memories and make what I am about to explain more clearly understood.

According to Coste, Robin, Friedländer, and De Sinéty, when the impregnated ovum comes into the uterine cavity, some eight or ten days after leaving the ovary, it comes in contact with the congested endometrium. It is stopped in the neighborhood of the orifice of the tube by one of the many folds which exist in the mucosa, and being pressed between these folds, it finally becomes *planted*, so to speak, in the mucous membrane.

The borders of this depression produced by the implanted ovum soon rise up and surround it; hypertrophy then takes place, and progressively the germ is closed in, imprisoned in a kind of cyst, whose walls are made up of the endometrium.

That part covering the ovum is called the decidua reflexa, while that which has been pressed in by the ovum and on which it is implanted, forming later on the placenta, has been termed the decidua serotina. And lastly, the endometrium, which has no relation to the ovum, is designated as the decidua vera.

At the commencement of pregnancy the ovum, as you know, is extremely small, and the decidua covering it is in contact with only a very small portion of the decidua vera, but towards the end of the third month the decidua reflexa is in direct contact with the entire decidua vera.

After the commencement of the fourth month the decidua vera and reflexa begin to close together, and from that time on both membranes are so intimate that they form but one. At the same time many very solid adhesions are formed with the chorion, the latter being, as you are aware, the external envelop of the ovum.

During the first two months the decidua vera is thick, very vascular, and covered with numerous folds, while its internal aspect is riddled with small openings, which are nothing more than the orifices of the uterine glands. But from this time it progressively loses its vitality, the folds disappear, it decreases in thickness, while the greater part of the vessels and their elements vanish.

This atrophy is most marked at about the fourth month, and at the same time the adhesion between the decidua vera and reflexa is about complete. According to Friedländer, changes take place which end in

the detachment of the decidua. These begin at the third month and have the following characters at the end of pregnancy: The decidua vera has no epithelial lining, being reduced to two layers, one glandular, the other composed of special cells. The first named is in direct contact with the muscular tissue of the uterus, and is composed of glands lined with epithelium and united by connective tissue. The second is made up of large round cells in the most superficial part, while that portion which is in the proximity of the glands is composed of spindle-shaped cells.

It is in the middle of the spindle-cell layer that is found the line of division of the decidua when this is expelled, thus leaving the glandular layer with part of the spindle cells adhering to the muscular tissue.

Robin, I would say, although giving an entirely different explanation as to the detachment of the decidua, specifies, that although the decidua vera loses part of its adhesions with the uterus at the fourth month of gestation, is more easily separated from it the farther pregnancy is advanced.

Now, what takes place in the decidua reflexa during this time? At the commencement of pregnancy it undergoes the same histological changes as the decidua vera, but the atrophy occurs much sooner, generally one month after conception. According to Kölliker, the glands, vessels, and epithelium diminish little by little as the decidua reflexa becomes atrophied, and during pregnancy all its elements disappear.

The decidua serotina takes on an entirely different growth. Quite in the beginning it presents no difference in structure from the decidua reflexa and hypertrophies along with it. The vessels increase in size and come into relation with the corresponding villousities of the chorion, and a hypertrophic condition results, which is just the opposite from the atrophic changes in the decidua reflexa. This hypertrophy results in the formation of the maternal placenta, while at the same time the villousities of the chorion, which are atrophied on the side of the decidua reflexa, become hypertrophied as well as the vessels they contain, and the result is the formation of the foetal placenta.

The atrophy of the villousities extending into the decidua reflexa is complete at the end of the third month, the placenta then being a distinct organ, developing proportionally to the growth of the foetus.

You will see from what I have said that the line of division of the decidua, which gives place to the detachment of that membrane, is well marked only at the fourth month of pregnancy. It is conse-

quently not to be wondered at that an abortion occurring during the first three months has, as a result, a partial expulsion of the decidua. It is evident that where the most active work is going on, namely, in the decidua serotina, that separation is accomplished with more difficulty, and it is precisely here that pieces of the decidua will remain undetached.

Now, the decidua vera is better placed to give rise to the production of hemorrhagic metritis, for it is only in a marked condition of atrophy at the end of the fourth month, and during the first three, especially the first two, it is very thick and vascular.

The etiology of *hemorrhagic metritis post abortum* is clearly the incomplete expulsion of the decidua.

As to the question of infection there is much difference of opinion. Pozzi and the regretted Professor Trélat believe that there must be infection in all metrites, and in this particular type infection is limited and local, the decidual *débris* acting as a good culture medium.

Other writers hold that the affection is due to the arrest of involution of the endometrium, caused by the retained decidua. For my part I am inclined to adopt the latter view, although the question will be settled when well-conducted bacteriological studies are attempted in this direction.

As to the treatment of hemorrhagic metritis there is but one, and that is the curetting of the uterine cavity. This should be done as soon as you are certain that the metrorrhagia is not simply due to the miscarriage, but is a symptom of a lesion of the mucosa that will only disappear by the removal of the retained membranes, for by operating as early as possible you will prevent your patient from becoming anæmic from abundant and prolonged bleeding.

Curetting should be immediately done if the life of the patient is in danger, but in the great majority of cases you will be able to control a metrorrhagia due to an abortion occurring in the first few months of pregnancy. To accomplish this you must employ hot vaginal irrigations or perform a careful and aseptic vaginal tamponade. Attacking the endometrium with the curette should only be resorted to when the metrorrhagia has become symptomatic of hemorrhagic metritis.

However, let me at once add, that if the metrorrhagia is of such degree as to necessitate an intra-uterine tamponade, my advice to you in this case is to curette the cavity, and then pack tightly and methodically with iodoform gauze.

Curettement is clearly indicated when hemorrhagic metritis has declared itself, and this may safely be said to exist as soon as a second

metrorrhagia appears. For example, when a woman who has had a miscarriage, accompanied by a very profuse hemorrhage, has what she thinks are her menses two or three weeks after the flooding, and this supposed menstruation is a real hemorrhage, surgical measures are indicated.

In performing a curettement you should be perfect in your anti-sepsis; the bowels should be moved the night before, and a warm vaginal douche of a one-per-cent. solution of sulpho-naphtol or creolin should be given the night and morning before the operation; the quantity should be three litres. The vagina should be scrubbed with soap and brush, and the bladder emptied with a glass catheter, which should be kept in a glass filled with a 1 in 1000 solution of bichloride of mercury.

When the abortion dates back several months you must dilate the uterus, but if the operation be performed soon after this has occurred, dilatation will not be necessary. The dilator should be either Reverdin's with its irrigator, or Hegar's sounds may be used.

You all know the technique of curettement, so I will only say a few words on this point; but let me say that to perform this apparently simple operation well requires a certain amount of skill; to curette is one thing, but to do it properly is quite another affair.

The patient should be put under *complete narcosis* with ether or chloroform, but in the infrequent cases in which one of these agents cannot be employed on account of some contraindication, local anesthesia may be obtained with a twenty-five-per-cent. solution of hydrochlorate of cocaine applied to the mucosa. This method is safe I think, because the curetting of the mucosa destroys the absorbing membrane.

The floor of the vagina is depressed with a Simon valve and the cervix lowered by a pair of forceps, care being taken not to exercise too much force in so doing.

As to the selection of the curette, I consider Récamier's and Rheinstaedter's by far the best. With the former instrument you are able to reach all the corners of the uterine cavity, while with the latter you can scrape the anterior and posterior surfaces, at the same time that the irrigation through this curette washes away the *débris*.

In recent cases I think a *dull* Rheinstaedter the best, but when the case is of some months' duration a sharp Rheinstaedter is preferable. You must curette methodically the anterior and posterior surfaces, then the fundus, sides and angles of the organ, until you hear the characteristic *grating sound* indicating that the muscular structure is reached. Bear in mind, also, that the uterus is easily perforated, even when great

care is taken, and although this mishap may not lead to any disaster, still peritonitis and death have been the result.

My principal reason for preferring Rheinstaedter's instrument is that the spoon is very large, and the mucosa is more surely and completely removed. Werth examined uteri which were removed at various periods after curettement had been performed, and found that the entire mucosa was never removed, as he found patches which were untouched by the curette, while in some places the superficial layer was wanting, and in others the muscular tissue was denuded.

A hot intra-uterine irrigation of sulpho-naphtol or other antiseptic solution should be kept up by means of a Rheinstaedter curette or a Fritsch sound during the operation, thus removing the *débris*. I have never seen a case in which there was serious hemorrhage following curettement, and if you are careful as to your antiseptics, there is absolutely no danger of infection.

The operation should be completed by drainage of the uterine cavity with sterilized iodoform gauze, which may be dipped in a forty-per-cent. solution of creosote in glycerin, which has a favorable action on the uterine tissues.

There ought to be no elevation of the temperature after the operation, and if there should be, the packing is to be renewed, intra-uterine irrigation being also given.

When all goes well, the gauze is to be renewed on the second day, and a new strip inserted after an intra-uterine douche has been given. I think it is always a good plan to irrigate the uterine cavity at the first change of dressings, because it will remove any *débris* of the mucosa which may possibly remain, and which is sometimes the cause of a slight elevation of the temperature. Remember that *the change of dressings must be done with as much antiseptic precaution as the operation itself*. You will renew the gauze again on the fourth day, after which time a daily antiseptic vaginal douche will be all that is necessary.

The patient must remain in bed for two weeks, and at the end of the third may take up her usual mode of life.

This patient will be curetted to-morrow and the above treatment will be applied, but on account of her considerable anæmia I shall give her iron in the form of *ferratin*, which, according to Germain Sée and others, is an easily assimilated preparation.

Ophthalmology.

SYMPATHETIC OPHTHALMIA.

CLINICAL LECTURE DELIVERED AT THE ROYAL VICTORIA HOSPITAL.

BY F. BULLER, M.D.,

Professor of Ophthalmology and Otology, in McGill University, Montreal.

GENTLEMEN,—Not long ago I had an opportunity to show you a case of chronic inflammation of the uveal tract in an eye injured by a piece of steel some twelve years previously. In this case the eye had been examined by an ophthalmic surgeon of high repute, who determined not to enucleate because he had in some way formed an opinion that no foreign body existed in the eyeball. After a long course of treatment the inflammatory symptoms subsided, nevertheless the eyeball diminished considerably in size and became perfectly blind. Since that time the shrunken eye has suffered several attacks of inflammation, attended with severe neuralgic pain both in the eye itself and in the brow and temple. The last attack which was the means of bringing him under our observation was of a similar kind. We noted an intense deep-seated ciliary or pericorneal congestion and an extreme sensitiveness of the eyeball when slight pressure was made upon it through the closed lids.

Now, this was a typical iridocyclitis with recurring exacerbations in a partially atrophied eyeball.

No scar or other trace of the original injury was discoverable, and the patient's statement that the eye had been injured by a small chip or fragment of metal was clear and definite.

Changes so disastrous to the eye could hardly be accounted for except on the assumption that the fragment had penetrated and remained within the globe, and although the sound eye presented nothing more than slight symptoms of sympathetic irritation, such as blurring of vision when used in near work, slight intolerance of light, and, as he expressed it, "the eye feels weak," we had all the conditions present which threaten an attack of sympathetic ophthalmia in the sound eye.

I therefore strongly urged enucleation. You well remember I predicted that we might find a foreign body in the shrunken eye, or a bony formation on the choroid.

After enucleation, section of the shrunken globe showed a large mass of dense laminated fibrin or, perhaps, lowly-organized connective tissue in the vitreous chamber; in the midst of this was a rusty chip of steel about four millimetres in length, two and a half in width, and one millimetre thick. The lens was represented by a tough white shred firmly adherent to the small and atrophic iris. The ciliary body, choroid, and sclerotic were abnormally thick, and the vitreous humor was replaced by a few drops of reddish-yellow turbid fluid. There can be little doubt that this case left to itself would have afforded another illustration of the axiom, "with a foreign body in the interior of the eyeball the occurrence of sympathetic ophthalmia is only a question of time."

The case I present to-day is another type of injury which I believe to be even more dangerous to the fellow-eye. The patient, you will observe, is a healthy man, about twenty-seven years of age; ten days ago he ran a dinner-fork into the left eye. One of the prongs penetrated the sclerotic on the horizontal meridian about two millimetres to the inner side of the cornea. The small wound is now quite healed, but you see it is in the so-called dangerous zone. The dangerous zone is that part of the front of the eyeball which corresponds to the position of the ciliary body, and it has received this title because clinical experience has shown that sympathetic ophthalmia is more liable to occur after injuries of this part than when the penetrating wound is confined to the cornea, or is situated farther back beyond the posterior limit of the ciliary processes. The entire visible sclera is intensely congested. The iris discolored and so adherent to the lens capsule that the pupil will not dilate in the least by atropine. The lens appears to be clear, but the vitreous humor is so clouded that no reflex from the fundus can be obtained by the ophthalmoscope. The eyeball is intensely tender to the touch and gives him great pain, especially at night. We have here a typical case of traumatic iridocyclitis of recent origin.

Now, I do not wish you to infer that all wounds in the ciliary region are especially dangerous, since I am persuaded that wounds of this part when made with a clean, sharp instrument, such as a sharp edge of broken glass, even when there is entanglement of iris or part of the ciliary body, may be so repaired that a favorable result is reasonably certain. The proper treatment of such wounds, if seen early, is their thorough cleansing with some antiseptic solution, such as per-

chloride of mercury one in three thousand, the removal of all entangled iris and ciliary body with sterilized instruments, accurate closure of the gaping scleral edges by means of one or more fine silk sutures through the episcleral tissue, an antiseptic dressing under a compress bandage for twenty-four hours, and after this compresses steeped in iced boric acid solution laid over the closed lids and changed frequently, with occasional instillations of *sterilized solution of atropine*, four grains to the ounce.

The case is very different when the wound is a lacerated one made with a blunt and unclean instrument, as in the present instance: under these circumstances we have no certain means of thoroughly disinfecting the wound, or of completely freeing it from entangled uveal structures, or of preventing, what we see here, a septic iridocyclitis, which tends to run a chronic and malignant course; malignant in its tendency to involve all the internal structures of the eye with its plastic inflammatory exudation, and in its tendency to involve the other eye in a similar, perhaps even more destructive, plastic inflammatory process.

Pathologists have up to the present time been unable to agree upon the precise nature of the process constituting sympathetic ophthalmia, notwithstanding the fact that the morbid conditions found in both originally diseased (exciting) and secondarily affected (sympathizing) eyes have time and again been subjected to the most searching investigations. That the pathological changes in both are similar in kind there is little room for doubt. In both there is an abundant exudation of leucocytes and plastic material, which does not as in ordinary iritis tend to become absorbed, but leads to the formation of new tissue with more or less destruction of the parts invaded.

The two cases I have shown you are typical of the commonest lesions which are known to give rise to sympathetic ophthalmia. In the first we have forestalled that event by enucleation of the injured eye, in the other a sufficient time has not elapsed to witness its occurrence. Other lesions than such as these are of course liable to terminate in the same way, such, for instance, as ruptures of the eyeball from gross violence, operations on the eyeball when followed by inflammation of the iris and ciliary region, intraocular tumors, cysticerci in the eyeball, bony formations on the choroid in old shrunken eyes, in fact, any condition which has given rise to a chronic and persistent irritation of the uveal tract, especially whenever the diseased eye is shrunken, tender on pressure, and liable to exacerbations of the inflammatory process.

The mode of transmission of the inflammatory process from one eye to the other is still a matter of conjecture.

(1) It is conceivable that the ciliary nerves of the affected eye might excite certain changes in the central nervous system, and that a morbid influence might thus be transmitted to the nervous and vascular system of the sound eye, just as the stimulus of light applied to one eye induces contraction of the pupil of the other ; such an explanation is, however, purely conjectural and not supported by any pathological data.

(2) It is possible that commissural nerve-fibres may extend from one eye to the other along the optic nerves, or that there may be a vasomotor connection along the same path capable of transmitting the morbid changes directly from one eye to the other.

(3) A more probable explanation seems to be that the lymph-channels in connection with the optic nerves form a direct medium of communication between one eye and the other. In support of this we have the well-established fact that the outbreak in the sympathizing eye not infrequently begins as a serous iritis with deposition of minute dots of lymph on the posterior surface of the cornea and proliferation of the endothelium of the anterior chamber, which itself is but an expansion of the interocular lymphatic system ; certainly this is not inconsistent with the most recent theory,—viz., that the disease is of bacterial origin, these organisms gradually finding their way along natural channels from one eye to the other.

Experiments with a view to establish the truth of this theory have not as yet, however, proved conclusive.

In whatever way the disease is transmitted in cases of traumatic origin a certain time must elapse between the original injury and the sympathetic outbreak.

The shortest time is conceded to be about two weeks, the longest, an indefinite number of years. During any of the recurring attacks such as our first patient suffered from the disease may make its appearance, while in the intervals of quiescence such eyes are perhaps innocuous. In this circumstance will be seen an explanation of the long interval which may elapse between the original injury and its ultimate disastrous consequences, and for this reason a blind eye which suffers repeated attacks of deep-seated inflammation is a constant source of peril to its owner and of grave anxiety to the medical adviser.

Nothing can be more insidious than the commencement of a sympathetic ophthalmia, and in children especially it is liable to be overlooked until hopeless changes have been already established. The patient or his friends will imagine, at the commencement of

the sympathetic trouble, that the sound eye has "taken cold," or that the visual disturbances it may present are of altogether a trivial character. There will be a blurring of vision perhaps not constant, a sense of discomfort rather than pain in the eye, a tendency for the eye to flush and water when examined, or when exposed to strong light, and perhaps a slight but constant pericorneal congestion.

In such an eye an expert will perhaps detect some change of color, and lustre of the iris, commencing adhesions of the iris to the lens capsule, and in some cases a deposition of fine gray dots on the posterior surface of the cornea; in others, the vitreous humor will show floating opacities in its anterior part, or there may be changes in the optic papilla and retina resembling a neuroretinitis.

Sometimes two or three weeks elapse before the disease is pronounced enough to excite serious attention. Only rarely a more stormy onset betrays its nature within a day or two from the appearance of its initial symptoms.

It is in children more particularly that the insidious character of this disease makes it more to be dreaded, for in these we may easily overlook premonitory symptoms and awake to find the enemy in full possession, while the sentry sleeps. More than this, there is reason to believe that a greater liability to sympathetic ophthalmia belongs to early life, though age does not exempt.

I need not rehearse the well-known phenomena of sympathetic ophthalmia when once it has gained a foothold, and as for treatment, I fear we are no further advanced than our predecessors of the past generation, only in this that the records of every year add to the small list of recoveries under the prompt and judicious use of mercury, atropine, and rest in darkness, with entire avoidance of operative interference until long after the subsidence of all inflammatory action. Prevention is ever better than cure, but how shall we say enough in favor of prevention where the chances of cure are almost infinitesimal.

The first essential is to have a clear conception of the conditions likely to set up sympathetic disease, and then in any given case to decide definitely on the course to be pursued.

The patient or his friend should be made to understand the situation, and to assume the responsibility if they are not prepared to follow your advice.

Nearly all ophthalmic surgeons are agreed that enucleation of an injured eye which threatens sympathetic ophthalmia is the surest

means of prevention, and when such an eye is obviously lost for visual purposes, most of them will unhesitatingly recommend this operation.

The operation of optico-ciliary neurectomy, when properly performed, is believed by some to be a not less certain preventive than enucleation, and if it were fully proved to be a trifle less safe than the latter, the question may be asked, whether it would not be justifiable to incur a slight additional risk rather than inflict upon a child the life-long mutilation of an enucleation?

Only in very recent injuries, where the eye is hopelessly lost, the operation of evisceration of the sclerotic with insertion of an artificial vitreous (Mule's operation) may be preferable to either of the other operations just mentioned. When the injured eye still retains some vision, but its condition is such as to endanger the other, the course to be pursued is not always so clear, and it may be that doubt and hesitation are unavoidable. If, however, under these circumstances sympathetic inflammation has already attacked the sound eye, the maimed one should not be removed, since experience has shown that its removal would not be likely to favorably modify the sympathetic disease, and it might happen that the injured eye would eventually become the better of the two.

[NOTE.—In the second case exhibited the wounded eye was, at the end of two weeks' treatment, soft, intensely congested, very painful and sensitive to slight pressure, and was rapidly becoming smaller. Enucleation was performed, and the sound eye remained unaffected.]

GLIOMA OF THE RETINA.

CLINICAL LECTURE DELIVERED AT THE ST. LOUIS COLLEGE OF PHYSICIANS AND SURGEONS.

BY JAMES MOORES BALL, M.D.,

Professor of Ophthalmology in the St. Louis College of Physicians and Surgeons;
Professor of Ophthalmology in the Woman's Medical College of St.
Louis; Oculist to the St. Louis City Hospital and the
Woman's Hospital.

GENTLEMEN,—This little boy, four years of age, is brought to us by the parents who wish our opinion concerning a large tumor which grows from the right orbit. The mother says that fifteen months ago the child stuck his finger in the eye, causing profuse lachrymation, which lasted one week, at the end of which time "the eye turned yellow and looked like a cat's eye." Following this there was pain and loss of vision. During the past winter the child "took cold," and after this was checked swelling of the right eye was noticed. About the 15th of January the child was brought to an oculist, who advised enucleation. The parents, however, would not consent until July, when the eye was removed. Removal was almost immediately followed by recurrence. Another operation was performed, only to be followed by a return of the disease. A third and also a fourth operation gave the same result. You can see the present condition of the child. The little one is very pale and there is great emaciation, although the mother states that the child has not lost much flesh in the last two months, and his appetite is better than for a long time. Such, briefly, is the history of the patient. The diagnosis is glioma of the retina. The parents have come to us asking if anything further can be done. Unfortunately, the case is an inoperable one, and they have been so informed.

A glioma is a neoplasm found in connection with nerve tissues. It is a tumor which grows from the neuroglia, or glia, the skeleton work of the substance of the brain and cord. A glioma, then, is found only in connection with the brain, spinal cord, or nerves. You

will remember that, in our lectures on histology of the eye, we spoke of the retina as the expansion of the optic nerve, and we described the eight or, as some observers claim, ten layers of that membrane.

The retina is essentially nervous tissue, and a glioma is the only neoplasm to which the retina is subject. Do not think, however, that this is the only form of new growth occurring in the eye. We find frequently that sarcomatous tumors grow in the choroid; that sarcomata and particularly melano-sarcomata are found in the ciliary body and iris; and that the optic nerve is subject to new growths, among which are the myxomatous, fibro-myxomatous, and sarcomatous tumors, all of which extend by continuity and involve all the tissues of the eyeball. Unlike the other forms of intra-ocular tumor, a glioma is never pigmented. We find occasionally in delicate children, the victims of acute miliary tuberculosis, that there are tubercular growths in the choroid. Microscopically, a glioma consists of a fibrillated reticulum, with many blood-vessels and small round cells, resembling the structure of a small-celled sarcoma. The cells contain large nuclei. In some specimens we find a large number of spindle-shaped cells, and then we call the disease gliosarcoma. A glioma grows usually from the outer or inner granular layer of the retina, but Iwanoff has observed cases in which microscopical examination showed the glioma springing from the fibre-layer of the retina.

What are the clinical features of glioma of the retina? Almost invariably this disease occurs in children less than five years of age, although a few cases have been observed in patients above sixteen, and one case has been recorded by Mervill in which the patient was twenty-one years of age. As a rule, however, glioma exists only in babes and infants. The disease has been observed as a congenital condition. Usually the first symptom to attract attention is a peculiar reflex from the interior of the eye, which, from its resemblance to a cat's eye, shining in the dark, was named by Beer and the older authors *amaurotic cat's eye*. At the same time the parents notice that the child does not see out of the eye on the affected side. In this, the first stage, the tumor is confined to the retina, which it gradually lifts up from the choroid. There is no pain, redness, or discoloration, so that, as far as the appearance of the eye is concerned, there is nothing to indicate the

FIG. 1.



Glioma of the retina. (Leber.)

presence of a malignant growth. The pupil is slightly dilated. An examination by the ophthalmoscope, or by oblique illumination, will show the presence of an intra-ocular growth, whitish, yellowish, or reddish yellow in color, covered with a plexiform net of blood-vessels and with a smooth or nodulated surface. If the growth springs from the nerve-fibre layer, there will be no detachment of the retina. However, it is the rule that the glioma grows from another part of the retina, in which case detachment occurs early. In this stage the lens and vitreous are clear, so that you will have no trouble in diagnosing the presence of an intra-ocular tumor even though you may not be able to decide about its nature. The early growth of glioma retinae is comparatively slow, and it may require months for the mass to fill the globe, thus completing the second stage. Early in the case the tension of the eye is not increased; but now increased tension, pain, and redness are noticed, while the little sufferer becomes peevish, emaciated, and cachectic. As the tumor grows, increase of intra-ocular tension becomes marked; the neoplasm enmeshes all the tissues of the globe, and finally breaks out either at the corneo-scleral junction in front or at the optic-nerve entrance behind. Once out of the globe it grows rapidly, forming a large, ulcerated, painful mass which readily bleeds at the slightest touch. This condition was named by the older authors *fungus hæmatodes oculi*. Now the growth of the glioma is more rapid than before, and the surrounding tissues as well as distant organs are rapidly involved, extension being either by continuity or metastasis. By continuity the optic nerve furnishes a road by which the glioma rapidly reaches brainward; while by metastasis the organ most often affected is the liver. The little sufferer finally dies by exhaustion.

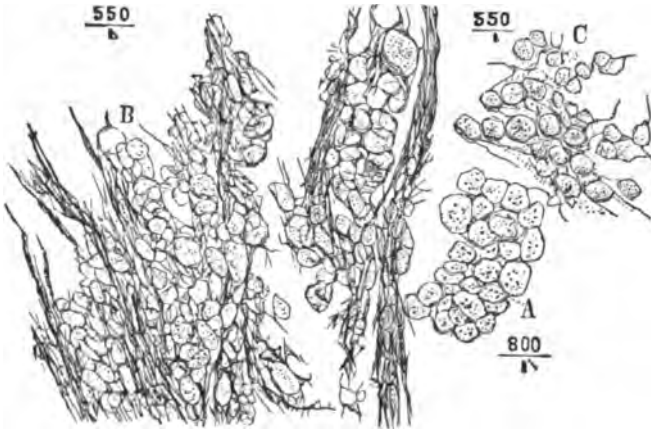
Generally the disease is unilateral, although many cases of bilateral glioma have been recorded. So often has glioma been observed in the new-born that many able observers conclude that it is caused by some congenital defect. In support of this view, Fuchs has recorded a remarkable observation in which a woman brought two children to him at a short interval, both of whom had glioma retinae, and died therefrom. Some time later the sorrowing mother brought her little babe for examination. This child had a congenital coloboma of the iris and choroid.

Is glioma a frequent disease? By no means. In Arlt's clinic, in Vienna, there were five cases of glioma retinae out of eight thousand four hundred and fifty-one patients; at the Wills Eye Hospital, in Philadelphia, there have been nineteen cases out of one hundred and eight thousand five hundred and seventy-eight patients. Coccia met

with the disease only three times among seven thousand nine hundred and ninety-eight patients. On the other hand, some few observers have seen a comparatively large number of cases, while others may have seen only one case.

The diagnosis of glioma is by no means easy. You might think, from the fact that the eye shows a peculiar reflex, that the vision is gradually lost, and that the patient is a child, the diagnosis would be an easy matter; but not so. We are obliged to distinguish between three conditions: first, glioma; second, pseudo-glioma; and, third, tubercles in the choroid. All these occur in childhood; all begin painlessly; all produce blindness; and at least the first and second cause the cat's-eye reflex. A pseudo-glioma is a condition in which the vitreous

FIG. 2.



Microscopical appearance of glioma.

becomes solid and opaque. Like many other words used in medicine, the term is a bad one. Pseudo-glioma occurring in children is usually met with in those patients who have just recovered from an attack of meningitis. The chief diagnostic sign between true and pseudo-glioma is that in the former there is an increase of the intra-ocular tension commensurate with the growth of the neoplasm, while in pseudo-glioma the tension is either normal or subnormal. Difficulty in diagnosis between these two conditions obtains only in the early stage of the case, for when the tumor breaks through the sclera there can be no mistake as to its nature. However, you should make a diagnosis early, since treatment is of avail only in the early history of the disease. Even should a mistake be made, the result would not be unfortunate, since eyes the seat of pseudo-glioma are useless, and generally

end in phthisis bulbi. In distinguishing between glioma and tubercles of the choroid, we must take the history of the case into consideration as well as the ophthalmoscopic appearances. Miliary tubercle of the choroid usually appears in distinct spots or nodules situated near the optic-nerve entrance or in the region of the macula. The tubercular masses appear as whitish-yellow masses or nodules in the stroma of the choroid, varying in size from one-eighth the diameter of the optic disc to the size of the disc itself. By confluence these small bodies sometimes form large masses. A rare condition is solitary tubercle of the choroid, which appears as a nodule and resembles a sarcoma. While you may not be able to distinguish between glioma and tubercles in the choroid, you have the satisfaction of knowing that the treatment of the conditions is the same. When cases of suspected intra-ocular growth are brought to you, it will probably be best to refer them to a specialist.

What is the prognosis in glioma retinæ? Without an operation these patients all die; with an early operation a few recover permanently. Generally, however, even with an early operation, there is a recurrence of the growth which attacks the deep orbital tissues, or perhaps the optic commissure, or the deeper parts of the brain. Sometimes the secondary trouble is a metastasis. Very early removal of the eye may save life, since it would appear that the disease is originally local. Hirschberg, of Berlin, out of seventy cases had five recoveries. Noyes, of New York, has had two permanent recoveries.

The treatment of glioma retinæ must be early and heroic. Only by such measures can we hope to save life. In the case of this child an enucleation was performed. This treatment agrees with the teaching of our authorities. I wish to go further than they, and advise you, in a case of glioma where the growth is confined to the ball, not only to enucleate the eye, but completely remove the orbital contents. I believe such an extreme measure is justifiable even in an early case. Of course, in cases where the glioma has pierced the globe no surgeon would hesitate to remove the contents of the orbit. Unfortunately, however, such cases are almost invariably followed by a return of the growth. If the child's parents, in a case of glioma of the first or second stage, should object to exenteration of the orbit, you will be obliged to limit your efforts to the enucleation. Should you do this, always excise three-fourths of an inch of the optic nerve. You can easily accomplish this by placing your finger in the orbit after removing the eye, and feeling the distal end of the nerve. While your finger is in this position, grasp the nerve with a long pair of forceps, hold the forceps then in your left hand, and with the right pass the blades of

the pair of scissors along the side of the nerve until the optic foramen is reached; open the scissors and cut the nerve. I have often done this in cases of panophthalmitis where sympathetic ophthalmia was feared. Excision of the optic nerve adds to the chances of a successful issue, but, of course, will not take the place of complete removal of the orbital contents. Should you meet with a case in which the glioma has attacked the orbital tissues extensively, it is your duty to operate, not so much to save life as to diminish fetor and suffering. Cases like the one under consideration are, unfortunately, inoperable.

FIG. 3.



Glioma of the retina.

If you ever meet with a case of glioma of both eyes the same principles of treatment will apply, although the parents will probably refuse operative aid. In view of the fact that two cases are on record where both eyes were removed simultaneously, presumably for glioma, which examination showed was not present, you should not remove both eyes at the same operation. It will be wiser to remove one, examine it carefully, and make a conclusive diagnosis. In case you make an early diagnosis, and an eye, the seat of glioma, still retains some vision, you should operate.

Otology.

EARACHE.

CLINICAL LECTURE DELIVERED TO A PRIVATE CLASS, IN ST. LOUIS.

BY ROBERT BARCLAY, A.M., M.D.,

Member of the American Otological Society; of the American Association for the Advancement of Science; formerly Assistant Aural Surgeon, New York Eye and Ear Infirmary, New York; Aural Surgeon, St. Louis City Hospital, Missouri Pacific Railway Hospital, St. Louis Baptist Hospital, St. Mary's Infirmary, South-Side Dispensary, Mariæ Consilia Deaf and Dumb Institute, House of the Good Shepherd, etc., St. Louis.

GENTLEMEN,—Of all the ills that flesh is heir to, few drive their victim to the physician more promptly than excruciating earache. Piercing the tympanic plexus, flashing along the auriculo-temporal nerve, wheresoever it may lay hold, it is ever the same relentless torment with intervals of dread. Coming upon the victim often where medical aid is unobtainable, it exposes him to the hazard of his own therapeutic essays, and desperate, indeed, these often are! as, for instance, with a farmer, whom I afterwards attended, who, maddened by excruciating earache in the small hours of the morning, went out to his well and there flooded the aching ear again and again with the coldest, fresh-drawn well-water.

On the other hand, earache may defy the remedial skill of our most esteemed professional colleagues, and, perhaps, drive the patient finally to us, with forlorn hope, pitifully appealing for aid; sometimes, indeed,—as in a case to be given you to-day,—demanding instant relief, and even threatening suicide if such be not promptly afforded. *Here* temporizing—philosophizing—talking is “beside the mark.” No time for “reference!” No peep at “compendium” or “remembrancer!” No timid postponement for a “consultation!” Action,—prompt and efficient action,—*immediate relief* is demanded; *that alone* is indicated, and “to the point!” We cannot substitute “something equally as good,”—for such is not. *Now* is “the time!” *Now* is the golden opportunity to inspire respect for our noble calling, and gain gratitude, credit, and reputation for ourselves! But, in our haste to

relieve the wretched sufferer, we must not lose sight of the rule: "Be sure you're *right*; then, go ahead!"

Inasmuch as earache is frequently the only indication as to the behavior of concealed and extremely dangerous organic ear-disease, it is usually unsafe to habitually cloak this symptom with an anodyne. How foolish—in fact, how criminally careless and meddlesome—were we, in such event, to extinguish the "red light," sole warning of impending danger!

On the other hand, this symptom—even where no organic aural disease whatever can be discovered—may prove so intolerable as to become practically a disease in itself; and something must be done promptly for its relief.

It is obvious, therefore, that we should discriminate, in any case, before proceeding to administer treatment.

In actual experience with cases of intense earache, it is surprising to note the great diversity of morbid conditions underlying this characteristic symptom. And, because of this diversity, we must ever be upon our guard, lest, in any given case presenting, by allowing our attention to be diverted too exclusively to this obtrusive symptom, we should be tempted to suppress it directly by remedial measures wholly inappropriate, perhaps actively aggravating to the underlying morbid condition from which the symptom originates. For, that such is apt to be the case is beyond reasonable dispute, since excruciating earache may arise from functional as from organic aural disease; originate in disease of associated, neighboring, or distant organs; be symptomatic of some constitutional disorder or disease; or be strictly neuralgic in nature,—diagnosis of "aural neuralgia" being admissible only through positive exclusion of every congestive, inflammatory, or other abnormal organic condition of the aching ear itself.

The propriety and advantage of making a careful and thorough preliminary examination to discover the condition of the ear, of its associated and connected organs, and of the patient himself, before proceeding to administer any treatment whatever for earache, may be appreciated, perhaps better, through a consideration of the following cases, of which

The first one (Case No. 804,978), quite fortunately, was casually submitted for examination and diagnosis by the attending physician, who, in apparent sincerity, stated that he was seriously considering the propriety of "trephining" the patient later in the day.

The patient was a young mother, thirty-two years old, who had borne one child. Thirty days before our consultation she began to

have "pains and fever in the head," first over the entire cranium, then upon the right side, and finally upon both sides. After two weeks of this, leeches were applied to the periauricular region,—five on the left side, seven on the right. She stated that she suffered intensely except when under the influence of morphine, which the attending physician had been giving her. For four days, however, she, without previous notice, had absented herself from observation, returning to her physician two days before our consultation.

On examination no active inflammation was found in either ear. Both drum-heads were manometric and retracted, as in the sketches (Figs. 1 and 2). The retracted drum-heads seemed closely adherent

FIG. 1.



Manometric, retracted, right drum-head,
adherent to the deeper structures.

FIG. 2.



Manometric, retracted, left drum-head,
adherent to inner tympanic wall.

to the deeper structures, and not detachable by Politzer tympanic inflation. In neither ear was the *pars vibrans* below, nor the *pars flaccida* above the so-called "folds" of the *membrana tympani* at all congested, and the hearing for the voice and whisper was normal.

The condition of the temperature, pulse, *facies*, etc., was not indicative of a possible serious inflammation within the ear or encephalon, although the patient seemed quite weak, either from morphinism, from suffering, or from both. She acknowledged that she had been under the care of an unusually large number of physicians for treatment of neuralgia and other ills. The attending physician seemed confident that the patient was not a morphine "fiend." Her somewhat muddy or ashen complexion, however, prompted a closer questioning, and elicited a history of *suppressio mensium* of one month's standing.

It is, perhaps, needless to state that the "trephining" was given up, and that the head and ear ceased, forthwith, to be the objective point of active therapeutics.

In instructive contrast to this is the case of a gentleman (Case No. 403,220), fifty-six years of age, who came to me bringing a note from

his physician stating that he, the "patient, *must have* relief to his ear pain ;" that he had been under treatment for "tertiary syphilis of the nose;" that the writer of the note, three days before, had "opened in his external auditory meatus a small, bloody cyst," and that finding "the drum-head bulging," he had referred him to me; the note closing with a request to "Please see *that he has* relief."

The patient was haggard and exhausted, and stated deliberately that he had made up his mind that if I could not and did not give him prompt relief from his agony, he would go and kill himself rather than suffer any longer. There was every indication that he meant what he said, so no pains were spared to discover the exact nature and cause of his earache at once.

The patient stated that at times during the preceding four months, while under treatment for ozæna, pieces of carious bone had been removed from the nares, and these passages cleansed by anterior and posterior nasal syringing with a solution of ordinary table salt in warm water. Until about ten days before our consultation he had been taking iodide of potassium; but upon noticing then a jaundiced appearance of his skin, he had discontinued it. Three days later he began to take quinine, twenty grains on the first, ten more on the following day. Upon the morning of the third day after this he awoke with "pain and aching in the right ear," which rapidly grew worse and worse. Within the next forty-eight hours he took no less than thirty grains more of quinine. The aching ear was douched with hot water repeatedly,—“a dozen times daily.” To alleviate his suffering large and frequent doses of the popular powerful anodynes were taken. Upon the second day of his illness “a small bloody cyst” of the canal wall was opened.

But all this in vain! The earache steadily grew worse, until it became excruciating, and for the last five days and nights he could neither sleep nor rest, so intense was his suffering. And, in consequence, he gave little heed to the fact that there was a constant ringing sound in this ear; that the sound of his own voice was unfamiliar to him, and that, on the affected side, he had become almost totally deaf. He had overlooked these symptoms until his attention was directed thereto by specific questions about them. In short, intense earache was the only symptom of which he complained, and upon which he seemed to tolerate the bestowal of necessary attention and inquiry, so impatient was he to obtain relief.

On inspection the drum-head appeared denuded of epithelium, highly inflamed, and bulging greatly, both above and below its so-

called "folds." It seemed probable, therefore, that the quinine and the frequent aural douching had served only to aggravate the aural congestion and increase the tympanic secretions. These secretions, finding insufficient vent through the swollen, congested Eustachian tube, had overdistended the tympanum, atrium, and attic, pressing outward the tense and flaccid *membranæ tympani*, and putting them and all tympanic structures upon the strain while bathed with acrid pus and pyogenic micro-organisms. With a nervous organism already enfeebled generally by syphilis and, locally, more so, perhaps, by the reflected irritation of prolonged nasal disease and its necessary local treatment, this aural tension and distention had probably occasioned the present suffering.

The prime indication was, of course, to liberate the pent-up secretions; the next, to treat antiseptically and with cleanliness the diseased parts, reinforcing this with appropriate tonic and antisyphilitic constitutional medication and hygiene.

The secretions, therefore, were liberated at once by a puncture of the lower segment of the drum-head, and a long, deep incision through the soft tissues, from the postero-superior quadrant of the drum-head upward, through the posterior fold and *membrana flaccida* on to the roof of the bony canal. The ear was then upturned, as the patient reclined upon a couch, and at once filled with Mallinckrodt Chemical Company's fifteen-volume solution of peroxide of hydrogen; and, after effervescence had ceased, the ear was refilled several times. Within a few moments great relief was experienced by the patient. Pain rapidly diminished; and, but for the sore feeling in the cut, ceased entirely before he left the office. Relief proved permanent, and under systemic, tonic, antisyphilitic, and local antiseptic treatment, the patient recovered rapidly from his aural abscess.

Somewhat resembling this in one of its clinical features is the case of a young woman (Case No. 703,922), aged twenty-four years, who, both day and night, for two or three weeks, had been suffering from jerking pain in her left ear. There was, however, no tinnitus, and deafness was very slight. Three years before she had had a "gathering" in this ear, which had been initiated by symptoms resembling those of the present attack. She had, therefore, adopted on this occasion remedial methods which she thought had been curative upon the former one, such as, for example, the aural instillation of olive oil and of peroxide of hydrogen, insufflation of boracic acid powder, but all without obtaining any relief from the severe earache.

After cleansing the ear carefully and gently, inspection revealed no evidence of acute aural inflammation to account for the earache; and no irritant was discovered upon any of the parts connected with the ear. Further inquiry brought out the fact that she was subject to frequent attacks of rheumatism. As this disease is known to manifest itself, sometimes, as aural neuralgia, her physician, as advised, placed her upon antirheumatic treatment, which promptly relieved her of her earache.

Here was a woman (Case No. 704,632), twenty years old, who for two weeks or more had suffered with severe earache and headache. The earache was worse upon the left side, and more severe in the daytime. Its intensity did not seem to vary with that of the headache; and, while the headache had remissions only, the earache had distinct intermissions.

On examination the auricles were found very hyperæmic, yet not tender. Both auditory canals and drum-heads were pale; the latter translucent to an abnormal degree. No local irritant or inflammation was found to account for the aural neuralgia. The mucous membrane of the mouth and the conjunctivæ were so pale as to indicate a general anæmia or chlorosis. The patient had been kept in confinement by law for a long time, previous to which she had led a dissipated life, in which she had contracted syphilis. For this latter disease she had been treated at one time.

The case seemed to be one of nervous depression, anæmia, and syphilis, giving rise to neuralgia of the ears and head. She was, therefore, placed upon specific and tonic treatment, which promptly relieved her.

Quite an instructive case is that of a stout, vigorous German (Case No. 104,805), forty-seven years of age, who was seen in consultation with an expert neurologist and the family physician, with a view to more certain differential diagnosis, more specifically to determine whether or not an operation upon the tympanum or mastoid process were advisable.

Eight years before this attack he had had some aural trouble, characterized chiefly by tinnitus and neuralgia of the ear. One month before the consultation he had contracted a severe cold, which was attended with headache and earache. From these he obtained brief temporary relief by aural instillation of some "ear-drops" extemporized by an enterprising "druggist," so-called. Earache recurring with greater

intensity, he had consulted, separately, two well-established, reputable specialists, who failed, however, to check the increase of his sufferings. The pain he endured had become so excruciating that, at the time when he first came under my observation, it was driving him nearly to distraction. His agony was intense and pitiful,—doubly so, as here, in a man stout, plethoric, vigorous, and otherwise apparently in the best of health. The pain, he said, flashed about the head from the front forehead to the upper part of the auricle and back to his neck. There had been no aural discharge, and the temperature and pulse did not indicate any general systemic disturbance or disorder. His pupils were normal. Treatment had failed to relieve his distress.

On examination, no evidence whatever of acute tympanic inflammation was found, nor were there any phenomena attributable to a possible inflammation of the mastoid cells. His throat was not much inflamed. His teeth, however, seemed to be in a sadly neglected, advanced state of disease and decay, being also coated with a thick mass of yellow tartar, while the neighboring gum was highly inflamed. One tooth particularly, which was upon the same side as the diseased ear, was very tender to pressure, and subsequently was found to be affected with pericementitis and alveolar abscess. The intense neuralgia was thought to have its origin at the dental terminals of the trigeminus nerve, and he was advised to obtain the services of a competent dentist as soon as possible. Acting upon this advice at once, he was thereby promptly relieved of his sufferings.

The next patient (Case No. 703,573) was a cloistered *religieuse*, aged forty-three years, who, twenty years before, had passed through an attack of measles, followed by purulent inflammation of the middle ear on both sides. This, with earache, persisted up to the nineteenth year, at intervals of two to six months.

The ears had been treated by douching or syringing with salt solution, and again by instillation of sweet oil and laudanum. Two years before the consultation she had experienced an attack of excruciating earache, which she had alleviated for a time by dropping into the ear some medicine of whose nature she was ignorant. Since then the right ear had "been quite dull." For two or three months the left ear had ached and felt otherwise disagreeable.

On examination, the right drum-head was found perforated in the antero-inferior quadrant, the opening being a trifle more than one-eighth inch in diameter, and the cul-de-sac of the canal contained pus. There seemed to be considerable dental irritation.

The ear was treated by instillation of Mallinckrodt Chemical Company's fifteen-volume peroxide of hydrogen, followed by insufflation of Squibb's boracic acid. The teeth were properly attended to by a competent dentist. Before a month had elapsed, attempts were made to close the perforation in the drum-head, after the method of Dr. Clarence J. Blake, of Boston, Massachusetts, already described in one of our previous lectures.¹ These proved successful, the perforation closing, and remaining closed.

Earache from acute congestion of the middle ear characterized the case of a girl, fifteen years old (Case 703,914), who had suffered intense pain in the right ear for the preceding twenty-four hours. Attempts to relieve by domestic therapeutic methods, such as the aural instillation of sweet oil, castor oil, and laudanum, were futile. For four years past she had been subject to "colds" and earache of from a day's to a week's duration. This last attack had been characterized not only by earache, but by slight deafness, autophonous voice, and pains shooting from the right ear in various directions,—over the corresponding side of the head, along the lower jaw, and "towards the shoulder-blade." Her bowels were habitually costive.

After removal of the surplus medicine which had been instilled into the auditory canal, slight hyperæmia of the drum-head was the only visible evidence of aural disorder. Nothing pathologically characteristic was recognized in the parts supplied by the trigeminus nerve—the suspected origin of her aural "neuralgia"—or elsewhere about the naso-oro-pharynx. A diagnosis of acute congestion of the middle ear was followed by the administration of a few small doses of tincture of aconite-root and calomel, which promptly relieved her.

This woman (Case No. 704,066), fifty-seven years old, had suffered for many years from neuralgia of the teeth and right ear, but without physical evidence of ear-disease until two weeks before our consultation. At that time the right ear began to ache and burn; and, on speaking, her voice seemed to her to reverberate in that side of her head. For five days just preceding the one before our examination she had poulticed the ear continually. It was stated that, for three weeks, she had been taking, three times a day, eight grains of iodide of potassium, prescribed by her physician for an arthritis of the right knee, of five or six weeks' duration.

¹ See INTERNATIONAL CLINICS, vol. ii. Fourth Series, pp. 334, 335.

On examination, a swelling, about the size of a half-filbert, was found at the right *crus helicis*; and, from a minute opening upon it,—which otherwise might have been taken or mistaken for a *fistula auris congenita*,—there was a purulent discharge. A small incision here, and subsequent dressing with an emollient ointment, effected prompt cure.

That severe earache may arise from inflammation of the throat without previous extension of that process to the ear is instanced by the experience of a woman (Case No. 704,511), aged thirty-four years, who had been kept in confinement by law for two years past.

On the evening before the consultation she had retired with ears feeling perfectly well, but had been asleep a short time only when she was awakened by an intense right earache, which persisted until the consultation. On the day before the earache began, the right side of her throat had hurt her. Eighteen months before she had had a severe attack of *la grippe*, followed by a sore throat, for which she had not sought medical assistance up to the fourth week preceding the consultation. Recently she had become subject to “night-sweats,” which, with certain other significant symptoms, had led her physician to suspect tuberculosis.

On examination, no physical evidence whatever of acute aural inflammation was found to account for the intense earache. In the oropharynx, however, a severe inflammation of the right side of the soft palate was discovered. The case appeared to be one of intense aural neuralgia reflected from the severely inflamed palate, and her physician, as advised, had emollient applications made to the throat, which promptly relieved the earache.

Another case that might have been mistaken for one of a similar nature was that of a young woman (Case No. 703,815), twenty years of age, who, two months before the consultation, had suffered an attack of acute tonsillitis. This was followed by pain and tenderness of the right ear, right eye, and right side of the head, so severe at night as to prevent her from resting this side upon the pillow. This had been attended by severe frontal headache, occasional vertigo, and a swollen feeling in the aching parts; but there had been no tinnitus, autophony, nor deafness.

On examination, the ear and other parts, to which had been referred the pain and other symptoms, were found apparently normal. The case appeared to be one of a neuralgic nature, and further questioning

brought out a history of habitually costive bowels ; and of sciatica, for which, three months before, she had been under treatment for about eight weeks. Moreover, previous syphilitic infection had been suspected by the attending physician. As advised, treatment for costive bowels and the rheumatic diathesis was instituted, and promptly relieved the earache and other symptoms.

The last case is a particularly instructive one. A young woman (Case No. 703,885), nineteen years of age, for three or four weeks had been suffering from a jumping pain in the ear and sublobular region. This affected both sides,—the right more intensely, and was intermittent. The pain began very suddenly one morning. It was worse in the daytime. There was, sometimes, ringing tinnitus aurium, but the voice was not autophonous, and there was no vertigo. Mastication was painful. She occasionally had headaches. When a little child, and again at about the age of puberty, she suffered from earache frequently,—perhaps from the first dentition, and from cutting the second molar teeth.

No characteristic pathological phenomena were discovered in the ears or naso-pharynx. In the mouth, however, both lower second molar teeth were carious, and the wisdom-teeth behind them were evidently coming beneath the gum. Dental treatment alone relieved her.

Dermatology.

LICHEN RUBER, ETC.¹

CLINICAL LECTURE DELIVERED AT THE ALLGEMEINE KRANKENHAUS.

BY MORIZ KAPOSÍ, M.D.,

Professor of Diseases of the Skin in the University of Vienna, etc.

GENTLEMEN,—The manifold diseases of the skin to which we apply the term dermatitis present the same general type with reference to efflorescence and pathological changes. In all cases we find redness and swelling, and the various diseases are distinguished from one another by individual characteristics only, such as the exfoliation in psoriasis, papule-formation in lichen ruber, etc. So, too, we may expect to find variations in degree: the variations may be slight or they may show high grades of intensity. Thus in psoriasis, though the process, in general, is the same whether we are dealing with an initial or a recurrent attack, it may happen that the individual papules take upon themselves greater activity and extend generally more and more until a universal eruption results. The same pathological process that has formed the basis of the structure of the individual efflorescence suddenly involves the entire skin surface, the process itself suffering no alteration thereby. The same may be said of the disease with which I desire to make you acquainted to-day. The peculiar features of the affection are so characteristically developed that I would hardly hesitate to make the diagnosis in the dark. You will notice that, with the exception of the chest, the clavicular region, the face, the shoulder, the interscapular region, the ulnar surface of the hand, and scattered areas on the dorsum pedis, on all of which surfaces the skin has its normal smoothness, the entire surface of the body is thickly covered with sago-sized, elevated, reddish-brown papules. These papules show but little desquamation, though here and there you may notice a few epidermal scales that differ from ordinary scales in that they look like little threads. In running my hand over the eruption, I get the same impression I would if it were in contact with a grater, and if at the

¹ Reported by Arthur J. Patek, M.D.

same time I apply pressure, you will notice that the redness disappears, from which we may conclude that the individual nodules have a hyperæmic base. We are dealing with the affection which Hebra originally described as "lichen ruber." The term "lichen" was applied at the end of the last century to all forms of papular eruptions. Hebra, however, reserved this term for those diseases only in which the efflorescent papule was the characteristic feature, as in psoriasis and urticaria, and in which the papules themselves did not develop further, as is the case with eczema, in which they change to vesicles, pustules, etc. Among the processes that present papules as characteristic efflorescence, there are, besides lichen pilaris (a low grade of ichthyosis), but two,—lichen scrofulosorum and lichen ruber. Various observers have reported these cases as characterized by pin-head and sago-sized, hard papules, covered with epidermal scales, and developing on different surfaces of the body in gradually enlarging groups. The individual papules retain their original size, but the superaddition of new growths to the old make the eruption much more dense, thus giving to the hand the impression of passing over a file, or, as the English say, over a nutmeg-grater.

The number of papules may be very great; and since the red bases on which they develop become confluent, there results a diffuse red area having a resistant surface. A hard infiltration results from this inflammatory base, and upon it large horny deposits develop, which, in contradistinction to the exfoliation of large flakes in psoriasis, hardly exfoliate at all. Thus, in the course of several months, we find an involvement of the face, scalp, trunk, and palmar surface of the hands. The thickness of the epidermis of the latter is such that we do not find individual elevations, but the eruption takes the character of an infiltration, owing to the heaping up of the epidermis. Extension of the fingers is materially interfered with, as a result of this thickening.

Owing to the involvement of their roots, the hairs fall out; the nails, too, degenerate, they likewise being epidermal structures. The process may extend to such a degree as to become a dermatitis universalis, not a single area from head to toe remaining unaffected (the first twelve or fourteen cases reported terminated fatally, with signs of marasmus only). Such areas as are well supplied with hair-follicles quickly become the seat of diffuse disease.

This affection was formerly but little known on account of its rarity. In the course of time we observed cases in which, in addition to the characteristic papules, there had developed polygonal, waxy nodules having central depressions. Erasmus Wilson described these as "lichen

planus." Since these cases of lichen planus occur at times alone, and are sometimes associated with lichen ruber, I have given to the combined process the name "lichen ruber acuminatus," and have designated the lichen planus of Wilson as "lichen ruber planus."

This classification had received general recognition until 1889. Besnier, of Paris, issued a publication claiming that the same disease had been described by earlier authors, especially the elder Devergie, who called particular attention to the "grater-like" feel of the skin, and gave to the condition the name "pityriasis rubra." Inspecting later this Parisian form of pityriasis rubra as described by Devergie, I found it impossible to distinguish it from lichen ruber acuminatus, for they are, in truth, identical.

Variations in the type of the disease may occur, the epidermis in given areas spreading out in elongated patches, the result of excessive activity alone. Again, it may happen that not only the papillæ but also the sebaceous glands between them may become involved. In this case, cores, easy of removal, project from the mouths of the glands. For this reason the process may have a different appearance on different parts of the body, especially on the face and hairy surfaces. Other variations also occur: while ordinarily the disease starts as small papules, and confluent areas result from a thickly concentrated eruption, it may happen that first a diffuse redness develops over a large surface, and that later the papules appear; or, large or small vesicles may develop upon this diffuse redness as a base, as is the case in pemphigus. I have reported a case of lichen ruber planus in which the eruption was arranged like a coral chain, and inquiry into the case showed that inflammatory infiltration existed primarily. This form I have designated "lichen ruber moniliformis."

Lichen ruber acuminatus may at times also form efflorescences having this coral-chain-like arrangement. Hebra saw but the lichen ruber planus, I having been the first to see the acuminatus variety of lichen ruber.

You are aware that lichen ruber planus is a benign affection, leading only occasionally to marasmus. Lichen ruber acuminatus, a dangerous disease, leading formerly always to marasmus, enjoys a much more favorable prognosis now, since the administration of arsenic has been practised. A course of treatment extending over six weeks does not, however, suffice here as in psoriasis, but the arsenic must be administered during many more months, if we wish to save our patients. Fatal issues do, nevertheless, occur; at one and the same time I had under treatment a general and a land-owner. The former is still living,

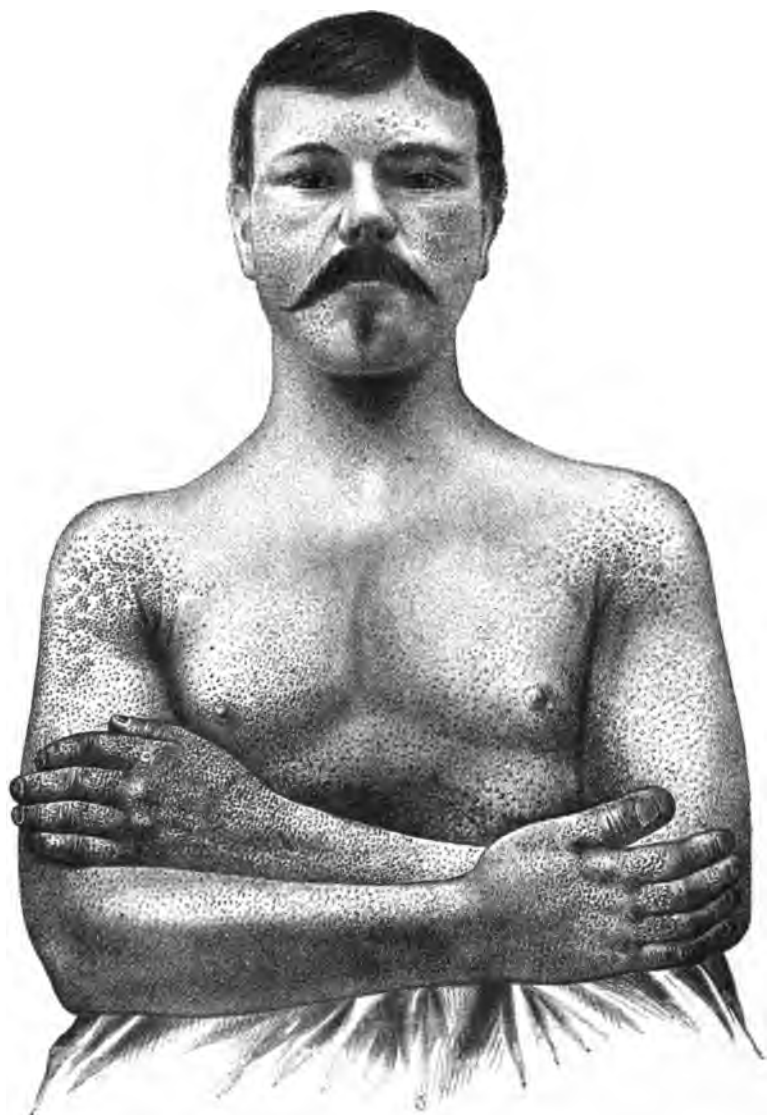


FIG. 1.—Distribution of the sago-like, elevated, reddish-brown papules in a case of lichen ruber.



while the latter, who passed from observation while improving, died in three or four months.

Nevertheless, arsenic remains the drug upon which we can best depend, and we may, in a general way, say that recovery will follow its use.

Local treatment is also of use; in the treatment of the rich scale-formation and the intense heat in the hands, a source of great distress, you may materially aid the internal therapy by the use of emollient salves, baths, rubber coverings, etc.

I wish to mention another extreme in development that almost shook my original idea of the disease. A child was brought to me suffering from lichen ruber acuminatus, and I had in mind making a study of the case. However, the papules soon became paler, the exfoliation less, and in three months the little patient was well. One must not be deceived by these variations that cases of mild degree present. As opposed to this case, I can cite that of a fourteen-year-old lad, whom I saw in 1867. He later became a high church dignitary. After the prolonged use of arsenic in the first attack, he was perfectly cured. Two years later, a recurrence set in, five years later a second, and then followed a period of twenty years during which he was entirely unmolested. Two years ago he came to us with a condition exactly similar to the original attack. He remained with us, and was discharged, after many months of treatment, in an improved condition. Last fall the eruption returned. He felt forced to resign his high position, and took up his abode in a little village. Of his present condition I know nothing, for many months have elapsed since I saw him last.

RHINOSCLEROMA.

You have heard the use of the expression sclerosis (hard chancre) when we were dealing with syphilis, and you will remember my saying that the sclerosis, although playing the part of an initial lesion, just as the mucous patch may do, was histologically a different structure. Virchow considers the mucous patch and chancre pathologically identical structures. I mention the expression "sclerosis" merely to call your attention to the fact that the term is of importance in other connections also, for we use it in the designation of various diseases, such as scleroderma, rhinoscleroma, and scleroderma neonatorum.

The affection called rhinoscleroma was first recognized as such here, and our experience taught us that similar cases had formerly been considered as of syphilitic origin. In 1868 we were confronted with a case which, though considered syphilitic, did not respond favorably

to treatment with mercurial ointment. We discovered that we were not dealing with syphilis. Hebra remembered having seen a number of just such cases that were undoubtedly not syphilitic in their nature, and, therefore, we described this affection, conjointly, under the term "rhinoscleroma."

Rhinoscleroma is a peculiar form of neoplasm. A thickening of the whole derm arises at the anterior nares, usually on the septum or alæ nasi. The cutis becomes thick and of ivory hardness, and the walls of the nostrils feel as if the nasal chambers had been filled with a plaster mould. The nose looks flattened, though this, in reality, is not the case, the delusion being due to a widening of its structure. The alæ and septum are so hard that it is impossible for the patient to press the alæ against the septum when wishing to blow his nose. The name given to the disease was, therefore, a good one. Experience has, however, taught us that similar processes may also affect neighboring structures. Thus, these flat, sharply-defined swellings are found on the lips too. They are not independently movable, being united with and part of the cutis, but the whole can be picked up between the fingers. The skin may have a normal color or be red, or it may resemble a scar of keloid.

Since this nasal thickening grows progressively more intense, an atresia nasi results, rendering breathing through the nose no longer possible. The process may also extend to the posterior nares and the internal auditory meatus.

A peculiarity of the affection is that it behaves differently from other new growths when a piece of its structure is excised: ordinarily when a piece of tissue is excised from a growth, the removal of this resistance causes the bordering surfaces to approximate. But in the case of the rhinoscleroma we find that, though it is as easy to cut into as is a cheese, the neighboring parts do not approximate. The tissue, on section, is anæmic and yellowish red. The defect repairs itself gradually, and in several weeks the growth is quite as large as before. The process presents, therefore, an unlimited power of growing, but no tendency to degeneration, although a central softening has been found in scattered cases. Ulceration of the growth does not take place.

We learned long ago that rhinoscleroma may attack the soft palate, and especially the basis uvulæ, where, as is well known, syphilitic gummata are also frequently found, the distinguishing feature being the inflammatory area that surrounds the base of the lesion in the latter case, but does not exist in the former. Other cases of rhinoscleroma, in which cicatrization of the soft palate resulted, looked

exactly as if preceded by luetic ulcerations, and it is doubtless true that many cases were formerly considered as syphilis. The disease may spread from the soft palate to the pharynx, and it has happened in rare cases that the process began in the mucous membrane of the soft palate, making the diagnosis extremely difficult, and spread to the epiglottis and larynx. Aphonia is the first result of this involvement, and the stenosis following is liable to be so severe as to render tracheotomy necessary.

Many cases of rhinoscleroma have been taken to be rhinophyma.

Since we now know that rhinoscleroma may attack not only the nose, as we believed in the beginning, but the soft palate, the pharynx, and the larynx as well, the term rhinoscleroma is not wholly correct. It might be more proper to designate the process as "scleroma," and to speak of it as a scleroma of the nose, the soft palate, the pharynx, etc.

At first I was inclined to consider the tumor a small-celled sarcoma, because of its structure and growth, for it is by no means a benign affection. Although the bones are never directly involved, the growth exerts such a degree of pressure, because of its hardness, that the bones may soften as a result. One case came to our notice in which the process had involved and perforated the frontal bone, and this gave us additional reason to believe that we were dealing with a sarcomatous growth. Mikulicz and Gussenbauer, who took up this subject later, decided that the rhinoscleroma must be considered an inflammatory growth, but I was not able to convince myself that an inflammatory growth could extend beyond all bounds and be so malignant.

Eight or ten years ago, Frisch found micrococci in the tissue of rhinoscleroma, and later investigation verified the existence of these cocci. They are capsule cocci and develop so rapidly that their growth may be demonstrated in a twenty-four-hour-old culture. Further studies have demonstrated their great similarity to pneumococci, and we must believe, on theoretical grounds, in some relation between the two, and that we are merely dealing with a manifestation in a different location.

We are strengthened in our view that we are dealing with an exceptional form of new growth, in seeing that, besides the points of resemblance to sarcoma, as mentioned above, there are others, such as histological structure and the presence of bone and cartilage cells as found in sarcoma.

As far as its prognosis is concerned, rhinoscleroma belongs to the most malignant of growths, and is a worse affection, in fact, than carcinoma. It may encircle the whole mouth, constricting it to so

small a calibre as to allow the introduction of only a pencil-sized tube for the giving of nourishment. On the other hand, there are also more favorable cases, in which the growth remains local and cicatrizes.

The therapy is essentially operative. In the ordinary cases in which the nose is involved a piece of tissue may be excised. Cauterization with silver nitrate or curetting with the sharp spoon may also be practised.

The impression, originally held, that rhinoscleroma occurred in Galicia and Bucowina only has proved erroneous.

SCLERODERMA ADULTORUM.

We designate this affection "scleroderma adutorum" in contradistinction to scleroderma neonatorum, though the latter would better be characterized "sclerema," for it presents a wholly different process.

This remarkable disease manifests itself in a hardening of the skin that develops suddenly on various parts of the body, the arms, legs, back, chest, neck, and face. In the case of the patient before you, his skin was, a few days ago, in a perfectly normal condition, but suddenly he noticed it becoming hard.

In its onset, the process shows itself as irregularly running bands; then, preceded at times by a redness of the surface, the involvement of larger areas follows. There is at the same time no appreciable change in the color of the skin; it seems, in fact, because it is so tightly stretched, to be even paler than normal, alabaster-like, and gives to the hand the impression as if it were in contact with a frozen cadaver, this feel alone sufficing to make the diagnosis.

It shows many variations and peculiarities in its spread. Occasionally we find such a surface running over the mamma, for instance, just as if a broad stiff band had been drawn across it. In this manner the process may continue for months or years, spreading itself over the entire body. It may then gradually fade away, the skin may become more and more soft and movable, and end in perfect recovery.

There is no disturbance of sensation even in the most severe forms, but when the whole body is involved, we may expect to find subjective symptoms. When the face is involved we seem to see a marble statue before us; the play of features is wholly lost; the patient can neither laugh nor cry; the nose is flattened and the nostrils do not move with breathing or talking; the mouth is small and drawn together, and the immobilization of the lips gives the impression that the spoken words are coming from an automaton. Locomotion is not interfered with unless the skin over the joint be involved.

If the sclerotic process does not return to normal, it may, in the course of months or years, suffer other changes. The skin becomes thin and atrophic and as a result is even more stretched. The epidermis exfoliates, telangiectasis occurs in places, other areas lose their blood-vessels, and finally pigmentation may follow. The skin looks as if studded with freckles. This is known as the stage of atrophy or cicatrization, while the preceding one is called the stage of sclerosis. Gangrenous ulcerations frequently appear on the extremities. The condition known as sclerodactylia is partly a scleroderma and partly a different process. In many cases the scleroderma is penny or dollar sized (a form called "morphœa" by the English), and here it is possible to confound it with lepra. But the anæsthetic areas so characteristic of the latter are not found.

The etiology of scleroderma is not yet known. Certain points have inclined one to believe that the nervous system is at fault, and this theory has been favored by the occurrence of an attack in an individual after a sudden fright. Again, in some cases, scleroderma seems to possess a localization similar to herpes zoster, following, for instance, the course of the trigeminus or cervico-brachialis. On the other hand, we have every reason to believe that we are dealing with a disease of the arteries characterized by an excess of the elastic tissue. Since the course of the arteries is in the main like that of the nerves, the cases of peculiar localization of the affection, as mentioned above, will be explained.

The disease usually begins in the middle-aged, although I have met with it in an eight-months-old infant.

The prognosis of circumscribed forms is quite favorable. Usually cicatrization takes place. In the diffuse forms the prognosis is, in the beginning, a very dubious one, and becomes less favorable in proportion to the duration of the affection. In the stage of atrophy the outlook is very unfavorable.

We know no remedy that has a positive influence upon the disease. Emollient medications, hot and steam baths will relieve the discomfort occasioned by the taut condition of the skin. Electricity and especially galvanism is said to have a good influence, and cases of recovery following its use have been recorded. The value of massage must not be underestimated, because through it we relieve the lymphatic stasis, which must be considered the essential element in scleroderma.

ROSACEA; INFANTILE ECZEMA.

CLINICAL LECTURE DELIVERED AT THE MEDICO-CHIRURGICAL HOSPITAL.

BY JOHN V. SHOEMAKER, M.D., LL.D.,

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ROSACEA.

GENTLEMEN,—This patient is a man, fifty-four years of age, the end of whose nose is swollen, red, and rough. It has been in much the same condition for several years, and has caused him inexpressible chagrin. When I closely inspect the diseased surface I perceive, in addition to the diffuse redness, a number of fine lines of the same hue and running, for the most part, in parallel directions. Here and there small papules, and also a few pustules, are present. The papules are of a deeper color than the general integument. The affected skin is greasy and shiny.

The patient states that in the beginning of the disease there was simply a redness upon the tip of the nose, and that the color gradually spread until it involved the integument covering the cartilaginous portion of the organ. Gradually, as time wore on, the streaks, which are most conspicuous upon the sides, became apparent, and neither the general blush nor the linear coloration have ever manifested any disposition to disappear. The papules and pustules are not always in existence, but will sometimes vanish and again recur. There is at times a sense of heat in the diseased area, but with this exception there are no subjective symptoms in the parts. The man is of full habit and reasonably strong. He declares that although he has long used malt liquors and spirits he has never been in the habit of indulging to excess. His appetite is good, but his digestion is disordered. He frequently suffers from nausea, his bowels are irregular, and occasionally he has colic.

The persistent redness disappears for an instant upon pressure, but quickly returns when the pressure is removed. In cold weather the

color becomes purplish or livid. The red lines or streaks evidently represent diseased and injected capillaries. In a word, the man is afflicted with rosacea, which consists in the congestion and dilatation of minute blood-vessels with infiltration of surrounding tissue and, eventually, hypertrophy of the connective-tissue elements and glands of the skin.

Rosacea is a very chronic affection. It occurs in both sexes, but is much more common in men than in women. In females it may develop at the age of puberty or at the menopause. It may also be coincident with disease of the uterus or its appendages. The disease, however, is most frequent during later middle life. The nose is its favorite location, but it is often seen upon the cheeks, and sometimes involves the entire face. Rosacea, in its progress, divides itself into three stages, although in this country and in these times the last stage is seldom observed. The first two stages are, however, sufficiently common. The initial period of development is known as the congestive, the second is the varicose, and the third the hypertrophic. Prior to the definite establishment of the first stage, attacks of erythema upon the nose and cheeks are of frequent occurrence. At length the seat of disease becomes permanently reddened. All the stages of the malady are of indefinite duration, though in rare instances it runs with rapidity through its different phases. Rosacea begins in small spots, which slowly enlarge and perhaps coalesce with similar ones in the vicinity. The engorgement is apt to excite the sebaceous glands and augment their secretion. In a more advanced form, the varicose, the capillaries become dilated and tortuous, and are visible as red lines upon the surface. The enlarged vessels differ considerably in apparent calibre, sometimes being thread-like and again of comparatively large dimension. It is not unusual to see the side of the nose marked by bright-red streaks, placed closely together, yet, nevertheless, individually distinct and converging towards the tip of the organ. In other cases almost the entire face is permanently flushed by a congeries of vessels. During the varicose stage the skin slowly thickens, becomes subject to the eruption of papules and pustules, and is roughened. In this condition it may remain for an indeterminate period without material improvement, but also without much change for the worse.

The final stage, when it occurs, is characteristic. The surface—generally the nose—becomes enormously thickened and lobulated, the sebaceous glands are enlarged and their orifices plugged with sebum, and the skin is of a dark-purple color and cold to the touch. In extreme examples the nose has been likened to the clapper of a bell. Such

distorted organs are sometimes designated by the term *rhinophyma*. This form of the affection is almost unknown among females.

The diagnosis of *rosacea* should not be a matter of difficulty. The pustules might suggest a thought of *acne*; and, indeed, the disease was formerly and is still by some writers known as *acne rosacea* and classed as a variety of *acne*, but *acne* lacks the persistent vascularity, the engorged and varicose capillaries, and the thickening of *rosacea*. Nor is *acne* confined to the face, while *rosacea* is a clinical curiosity upon any other part of the body. A syphilitic erythema might possibly be confounded with the congestive stage of *rosacea*, but in secondary syphilis we have other evidences of the nature of the infection in fever,—falling of the hair, buccal lesions, and osteocopic pains. Moreover, the color of syphilitic lesions differs from that of *rosacea*. The later lesions of syphilis, such as pustules and tubercles, spare the sebaceous glands, they are not confined to the face, and they are usually associated with ulceration and the formation of crusts. They are larger and of firmer consistence than those of *rosacea*. In syphilis we find no varicose capillaries. The lesions of *rosacea* are bright red and do not ulcerate. *Lupus erythematosus* bears a certain resemblance to *rosacea*, but in the former affection the patches are covered with thin yellowish scales, and their margins are more distinctly outlined than those of *rosacea*. The lesions are somewhat elevated, while in the centre is seen a cicatriform spot, which thus differs entirely from *rosacea*. A closer likeness exists between *rosacea* and frost-bite, but in the latter there is much swelling, and the surface is of a purplish color. In *rosacea* the surface is bright red and greasy and the swelling is comparatively slight. The history of the two affections will furthermore serve to make a clear distinction.

Rosacea is caused by influences acting from without or within the organism. Whatever conditions favor long-continued capillary engorgement tend to produce this disease. It is for this reason that we encounter it among cooks, bakers, engineers, and others whose occupation exposes them during much of the time to the action of heat upon the face. Cold and wind also have the same effect upon the circulation of the face, and, accordingly, *rosacea* is common among coachmen, carters, sailors, and those who constantly confront inclement weather. Many toilet preparations are very irritant and excite *rosacea*. The paints used by actors and actresses not uncommonly lead to the development of this disease. The same is true of articles habitually used by females in order to conceal the ravages of time. Internal conditions may occasion *rosacea* if they directly or indirectly conduce

to dilatation, engorgement, and paresis of capillary vessels. Hence chronic indigestion, disease of the liver, anæmia, chlorosis, rheumatism, and gout are apt to be accompanied by this affection of the face. A very common and perhaps the most frequent cause of rosacea is the daily use of alcoholic liquors. This seems to be the origin of the malady in the case now before us, although the patient strenuously denies intemperance. This word, however, in the conception of drinkers, is of very elastic signification. On the contrary, we are not justified in leaping to the conclusion that all elderly men troubled by rosacea have been drinkers. I remember a well-marked case of the hypertrophic stage in a man of strictly abstemious habits. Some chronic disorders of the skin, as, for instance, acne, may be followed by rosacea, and I have known the latter disease to supervene upon an attack of eczema of the nose.

The treatment of rosacea must vary according to the cause and the stage of the disease. When dependent upon or associated with constitutional disorder or visceral disease, appropriate internal treatment must be adopted. Affections of the uterus or ovaries must be, as far as possible, corrected. Rosacea developing at the menopause is often complicated with flushings of the face and throbbing of the blood-vessels. In this condition relief is obtained, as suggested by Ringer, by the use of nitrite of amyl, either inhaled or taken by the stomach. In the latter method, two minims are dissolved in a drachm of alcohol and taken in doses of three to five drops, repeated at intervals of three hours while needed. Anæmia and chlorosis require iron, rheumatic and gouty states of the system call for special medication, and high livers must submit to regulation of diet and abstinence from drink. Chronic dyspepsia or gastro-intestinal catarrh must be carefully treated.

All cases of rosacea need local care. The nature of our topical remedies must differ according to the stage of the affection. As a general rule, bland applications succeed best in the congestive stage, while stimulant measures are often of most value in the varicose form of the disorder.

When congestion is the most conspicuous feature of the case, an excellent application is the ointment of the oleate of bismuth, which is gently spread upon the surface twice or thrice a day. The oleate of zinc, subnitrate of bismuth, or equal parts of each combined with starch or arrow-root are dusted upon the parts after the oleate of bismuth ointment has been used. The carbonate of zinc is another serviceable remedy. Sulphur ointment is sometimes of advantage in

the first stage, and I have witnessed good results from an application of ten grains of chrysarobin dissolved in solution of gutta-percha.

In the varicose stage our object is to secure depletion and obliteration. Astringent and stimulant substances are applied to the skin for this purpose. Among agents beneficially employed during the second stage are witch-hazel, glycerin, sulphur, mercurials, chloride of zinc, and caustic potash. A simple and efficacious procedure is to paint the nose with collodion. The oil of ergot, either alone or mixed with an equal quantity of glycerin, is also of value. The most powerful agents in this stage, however, are puncture, cautery, and electrolysis. Puncture freely with a small needle-knife, at the same time sponging the surface with hot water. The vessels may be obliterated by passing into them a fine needle heated to redness, or by the galvano-cautery. Electrolysis is an effectual and less painful method. Hypertrophic rosacea is treated by deep punctures, scarification, cauterization, electrolysis, or excision of redundant masses.

The man before you shall be advised to abstain strictly from alcoholic beverages. His diet shall be regulated, and he shall be given—

R Acid. nitric. dil., fʒv;
 Strychn. sulph., gr. i;
 Tr. capsici, fʒi;
 Elix. calisayæ, q.s. ad fʒiv. M.
 Sig.—Teaspoonful after each meal.

Topically, I will to-day deplete the parts in your presence with the needle-knife, after which he shall be directed to use the bismuth oleate ointment, followed by the dusting-powder, in the manner already indicated.

INFANTILE ECZEMA.

Our remaining two patients illustrate a common infantile affection, and one which severely wounds the pride of fond young mothers, above all when the baby is the first of the family.

This boy baby, seven months of age, has had an eruption upon his scalp for six weeks. In the beginning, a red spot or patch came out upon the head which was hot to the touch. The flush rapidly extended until the top of the head was nearly all covered. The disease rendered the little patient very fretful, interfered with his sleep, and caused his appetite to fail. After the redness had been present for a few days, little vesicles formed, ruptured, and discharged a yellowish fluid, which dried and formed crusts. You can see that a great part of the scalp is covered with yellow scales, between which, here and there, a bright-red, raw surface is discerned.

The second infant, also a boy, is four months old. In this case the disease is situated upon the cheeks, both sides being involved, and the patches being nearly symmetrical. The appearance of the lesions is similar to that of the first case, and the history is not different. Vesiculation was more prominent in the second case from the beginning, its course has been more rapid, having developed within the last three weeks. The surfaces affected are full of crusts, and when these are detached are raw and moist. The babe has some sickness of the stomach, is peevish, and thrives less than before the outbreak of the disease upon the cheeks.

Both babes are bottle-fed. Both were perfectly healthy at birth and until attacked by the disorder from which they now suffer. This statement at once establishes a presumption against the diagnosis of syphilis. A syphilitic baby is scrawny and has an old face, snuffles, and is very apt to have disease of the eyes. The eruption of hereditary syphilis is generally present about the genitals and upon the buttocks as well as upon the face. There is no evidence in these children of parasitic disease, and the chronicity of the lesions forbids the supposition of urticaria. The malady with which we have here to deal is infantile eczema. Babes and young children are particularly prone to eczema. Attacks readily occur as a consequence of improper nourishment or assimilation or the irritation of unsuitable clothing. The affection has usually an acute beginning, but subsides into a chronic condition. The formation of crusts is a common characteristic. In scrofulous children the lesions often suppurate freely, and, when the scalp is attacked, form large yellowish-brown crusts, unsightly to behold. This manifestation is known as *crusta lactea*, or milk crust. Sometimes inflammation or suppuration of the glands of the neck supervenes. Infantile eczema occurs particularly upon the face and head, although other parts where the skin is thin may be involved.

An insufficient supply or an inferior quality of nourishment, together with irregular hours of feeding, are the usual causes of eczema in infants. In both the cases before you the mother has been unable to nurse the babe. The first requisite of successful treatment is, therefore, the arrangement of the diet. All the other hygienic requirements must also receive careful attention. It is generally a good rule to begin medical treatment with a mercurial purgative or castor oil, and secure a thorough evacuation of the alimentary canal. The purgation may be repeated every few days, according to circumstances. In some instances the bowels are too free and need to be checked. When the little patients are insufficiently nourished, cod-liver

oil, preparations of phosphates and hypophosphites, syrup of iodide of iron, and similar reconstituent remedies aid in the treatment. In occasional cases so much constitutional reaction is manifested that service is rendered by the exhibition of aconite and spirit of nitrous ether.

As regards local management, on account of the tender age of the patient and the delicacy of its skin, harsh measures are inadmissible. Crusts are cleared away by the action of baths and poultices. A starch poultice is soothing and efficient, and will be ordered in these cases. After the surface is free from inflammatory products a demulcent or mild astringent is applied as a powder, ointment, or lotion. Where the lesions give rise to considerable moisture, a dry, absorbent dusting-powder is generally of advantage. In some cases fluid applications are most successful. This is a matter of choice which cannot always be determined beforehand, but a little experience will usually direct us to the right path. As a dusting-powder will not remain adherent upon the cheeks, and as there is not much hair upon the scalp, I shall in both these cases make use of ointments. For the older babe I shall prescribe an ointment containing five grains of aristol to the ounce of cold cream, and for the younger, one composed of—

R Acidi borici, ℥ss;
Zinci carbonat., ℥i;
Bismuth. subnitrat., ℥ii;
Pulv. marantæ, ℥ii;
Lanolin., ℥iii;
Ungt. simpl., ℥v. M.

ECZEMA SQUAMOSUM; SYPHILIS CONGENITA; SYPHILODERMA TUBERCULOSUM; PSORIASIS.

CLINICAL LECTURE DELIVERED AT THE VANDERBILT CLINIC.

BY GEORGE THOMAS JACKSON, M.D.,

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GENTLEMEN,—The first case that I shall present to you to-day is one that I am sure you will recognize as a case of SQUAMOUS ECZEMA on the face of a child. At this stage of the course perhaps you will begin to think that you have had enough of eczema. If so, it is a mistake, because it is far more important for you to recognize and to know how to treat this disease than any other.

You see that the skin of both cheeks of this child is reddened and scaly, and when you pass your finger over it you feel that it is thickened, dry, and harsh. I advise you to educate your sense of touch in dermatology as much as in obstetrics, because you can learn a good deal by the sense of touch. The dry, harsh, leathery feel that you find in this case is characteristic of eczema. Now, you remember that redness, thickening of the skin, itching, crusting or scaling, a tendency to moisture, and cracking are the characteristics of eczema. In the case now before us we have redness, itching, as evidenced by the scratching, thickening of the skin, as shown by the sense of touch, and scalliness. The eruption is upon both cheeks, and nearly symmetrical.

Having made the diagnosis, we proceed to the treatment. As I have told you, the treatment of eczema, or at least its principles, are easy. When you have an acute case with swelling and redness and acute vesiculation, papulation, or pustulation, the skin should be treated as gently as possible with alkaline bathing or the application of some such thing as cold cream or vaseline, followed by free dusting with corn-starch or talcum powder. A very good talcum powder is that sold as "compound talcum baby powder." The acute stage will

soon pass over under this treatment, and as soon as it subsides we have a subacute stage in which there is a continued appearance of papules, vesicles or pustules, or simple redness with scaling. Now, we use protective ointments containing astringents, and the type ointment of this class is the oxide of zinc ointment with benzoated lard. After a time this stage passes, and we have left a thickening of the skin with redness and scaling. Now we want stimulation, and the type of stimulants for this stage is tar, and preferable the oil of cade, the usual strength being a drachm to the ounce.

In the case now before us we have only redness, scaling, and thickening of the skin without any signs of acuity. We therefore use stimulation and prescribe the oil of cade, one drachm, in oxide of zinc ointment, one ounce. Under this treatment we will find the thickening of the skin gradually disappear, and the scaling lessen.

The next patient I show you is this little baby with an eruption on the face. The child is of good size and development for one only a month old. The eruption is not only on the face, but occupies nearly all of the body. It consists of a great number of isolated, dull-red lesions, with no tendency to run together and form patches. Upon the soles there is an attempt at the formation of bullæ. The lesions on the body are hard and raised, so that by palpation alone you can discern the existence of the eruption. It is, therefore, a papular eruption. On the face and about the mouth are some crusts, and about the latter situation the skin is of a brownish hue. The eruption does not itch except where it has become crusted. Almost all eruptions which are crusted are apt to itch. There is nothing peculiar about the cry of this child; snuffles are not present, and the mother tells us that the child nurses without difficulty. This is a typical case of **INHERITED SYPHILIS**, except that there is nothing characteristic about the cry, the nutrition is good, and there is an absence of snuffles. A syphilitic baby usually has a peculiar "toneless cry," which once heard will be remembered. There can be no doubt about the diagnosis, because there is no disease with a similar eruption, and in which the palms and soles are affected as in this case. A bullous eruption on the palms and soles is almost pathognomonic of syphilis in children. If the eruption over the body were eczematous, you would find that the lesions would run together to form patches; there would be considerable itching, crusts would form, and the folds of the skin would be apt to be affected.

Inherited syphilis is often wrongly diagnosticated, as it evidently

was by the midwife in this instance, who, as the mother tells us, called it "red gum." Such children are usually born with a perfectly natural-looking skin, but after one, two, or three or more weeks the eruption begins. There is in children no division of the disease into stages, as in adults; there is at once either a papular or a bullous or other eruption. If the eruption be not properly treated, the disease will spread all over the body, snuffles will appear, and the child will begin to emaciate until it will in time assume "the old man" appearance, with wrinkled skin and woful countenance. The best evidence of the success of your treatment will be a gain in the weight of the child.

Congenital syphilis is a most fatal disease in infants, although when recognized and subjected to proper treatment it is usually curable, especially if you can secure the co-operation of the parents or guardians of the child. The first thing to do is to secure the best possible hygienic surroundings, carefully regulating the feeding, and giving the child as much fresh air as possible. The medical treatment consists in the use of inunctions of mercurial ointment. The children should be allowed to do their own inunctions,—that is to say, you take a piece of gray ointment, about the size of the end of your finger, divide it into two portions, spread it on a cloth, and tie it around each elbow. The next day you put a similar piece over the abdomen under the belly-band; the day following in each groin, etc. The natural motions of the child carry out the process of inunction. At the same time the mother needs medicinal treatment. This mother has been married six years, and has had three children, and a miscarriage shortly before she became pregnant with this child. The mother presents no evidence of the disease, which is often the case. She now tells us that four and a half years ago her first child was born "all covered with sores," and that it lived only eighteen hours. The second child was likewise covered with an eruption. Usually in such a case the first conception results in an abortion at an early date, the next pregnancy terminates a little later, and perhaps in the third or fourth pregnancy the child is carried to full term. She has apparently never had any treatment for her disease, and it is important now that she be given treatment. Preferably I should give her what is known as "mixed treatment." This will affect the child through the nursing. I expect that this child will do well. The child is to be weighed to-day, and again just before it returns to us, ten days hence.

Here is a woman suffering from a cutaneous disease of the hand, which it is very important that we should diagnosticate correctly.

The first thing one would naturally think of in this case would be eczema. There is redness and thickening of the skin, with cracking,—all signs of eczema. On closer inspection we observe a sharp boundary line to the patch on the fingers, whereas a patch of eczema shades off into the sound skin. On the wrists we find a patch having the shape of a figure 8, and another patch farther up has a similar shape. The borders of these patches are more infiltrated than the centre, and the color of the lesions is a dark red. The affection exists only on one hand. This latter point is important, and with the other signs leads us to make the diagnosis of a SQUAMOUS TUBERCULAR SYPHILIDE. There is also another symptom that you will notice, and that is the free sweating of her palms, which has nothing to do with her syphilis, but is a pure neurosis. If it were not for the patches on the anterior face of the wrist, and that only one hand is affected, it would be almost impossible to make a correct diagnosis on account of the great similarity the disease bears to eczema. Although it is uncommon for squamous eczema to occupy two fingers, leaving one unaffected between, as in this case, still it may occur, and this point alone would not be sufficient for differentiation between the two conditions.

We know that the more localized the lesions of syphilis are the later the stage is apt to be ; the more generalized it is, the more recent the infection. When I ask the patient how long she has had it, she replies "about twenty years," and if you did not know the nature of the disease you might think that she had answered correctly, and that the lesion was one of a tubercular rather than of a syphilitic nature. Further questioning brings out the fact that she has had it *at intervals* for the past twenty years. This is a distinctly late or tertiary syphilide.

If you should treat this case as one of eczema it would not get well. It is always hard to treat cutaneous affections of the hand, because these parts are subject to constant irritation. These patches should be covered with mercurial plaster, and she should be given internal treatment. As the disease is of long standing, we may give the iodide of potassium, or the mixed treatment, which often acts as a tonic.

I have now shown you two cases in the extremes of life, but both examples of the same disease, and exhibiting the skin lesions in a typical manner.

Here is a young girl with a lesion of the scalp. You notice that the head feels "lumpy," and the hair is extremely dry. When a case

of disease of the scalp presents itself, you must first think of the possibility of the existence of pediculosis. You should look at the back of the head and over the temples in order to see whether there are any pediculi or ova present. The ova of pediculi are pear-shaped, yellowish-brown bodies, and they are always fastened on to one side of the hair and with the large end up. The small bodies on the hair in this case are of a grayish color, and are neither pear-shaped nor closely attached to the hair. We may, therefore, exclude pediculosis. We should next think of favus. That disease is beginning to be quite common in this country. It occurs as sulphur-yellow lesions scattered over the scalp. Now, favus not only destroys the hair, but also the scalp. On removing the yellowish crusts you will find the surface underneath moist, and the scalp atrophied. The crusts in this case are yellow, but there is no tendency, as in favus, to the formation of cup-shaped crusts, nor any atrophic change in the scalp. We can, then, exclude favus. We have left psoriasis and seborrhœa. The markedly circumscribed character of these lesions presents a picture very much like that seen in psoriasis, but sometimes seborrhœa will also form aggregations of this kind. We should recollect that psoriasis of the scalp alone is very uncommon; there are usually other and typical lesions on the body if the case be one of psoriasis. Again, in psoriasis there is generally a scaly patch, either in the ear or in front of it. In a case of psoriasis the patches will be found most often on the tips of the knees and the elbows. We find in this case on the elbows a pinkish-red patch, tipped with a scale, the characteristic lesion of psoriasis. You will notice that the lesions on the scalp have not the outline of seborrhœa, they are very sharply circumscribed. It is rare, I admit, to find such marked lesions on the scalp, with so little on the body in cases of psoriasis. Still, we can make a positive diagnosis of psoriasis.

In treating the case the first thing to do is to soak the scalp thoroughly with sweet oil or cotton-seed oil. This is kept on all night and washed off in the morning, and this is repeated for two or three nights, or until the crusts are entirely removed. No attempt must be made to pick off these crusts. Having removed the crusts, you may use the sulphur ointment, one drachm to the ounce, or you can use the unguentum hydrargyri ammoniati, two parts to one part of vaseline or simple ointment. Under this treatment you will find that she will get entirely well. I do not mean to say that she will be permanently cured, however, for psoriasis is quite sure to return time after time.

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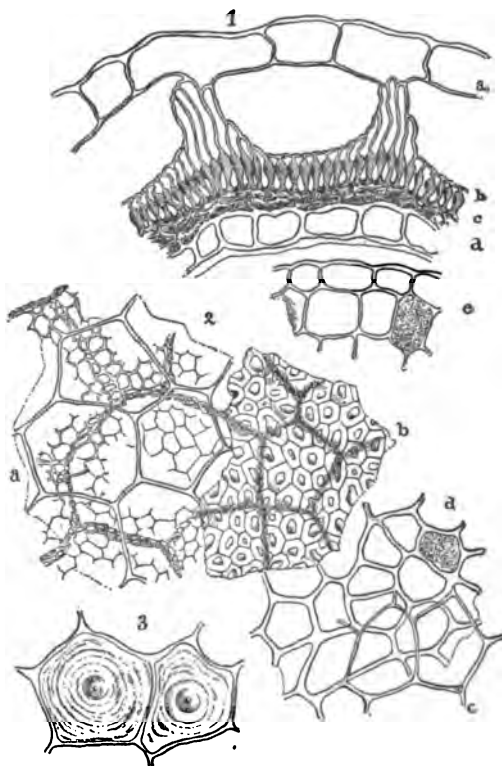
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In offering to the professions of Medicine and Pharmacy the seventeenth edition of the United States Dispensatory, its editors desire to thank most heartily their professional brethren throughout the world for the generous appreciation of their labors,—an appreciation which has been to them a strong incentive for continuous effort. The alterations in the late revision of the United States Pharmacopœia have almost amounted to a revolution, and have necessitated corresponding changes in the Commentary, whilst the extraordinary outcrop of new remedies during the last decade has lent a peculiar freshness and novelty to the seventeenth edition of the United States Dispensatory as contrasted with the one immediately preceding it. The claims made for these new remedies have been so urgent, and the desire for knowledge of them on the part of the profession is so universal, that the greatest care has been exercised by the editors of the Dispensatory to consider them all fully, and especially to point out in the therapeutic paragraphs those minute details in which remedies closely allied to one another differ in their action.

The introduction of the Metric System into the United States Pharmacopœia marks an era in the practice of pharmacy in America. This change, although long foreshadowed, involves the uprooting of a system of weights and measures which has been in common use for centuries; and, while there can be no doubt that the exclusive employment of metric quantities in the preparation of medicines will be hailed with satisfaction as a great advance in facilitating practical operations, it still remains a fact that at the present writing the vast majority of pharmacists in the United States are not accustomed to the system of weights and measures used by nearly every civilized nation in the world. For the present edition the editors believe that it will conduce greatly to the interest of the large number of readers of the United States Dispensatory to place immediately after each metric quantity its corresponding equivalent in the ordinary weight or measure, since in this way each reader will see at a glance the equivalent of an unfamiliar term in one which is known, and thus in a short time the new



1. Transverse section of the shell of a seed: a, epidermal layer with cells empty; b, connecting layer; c, layer of pigment-cells; d, parenchymatous cells; e, embryo. 2. Fragment of seed from a surface point of view; parts as in 1. 3. Cells from the epidermal layer, full of mucilage.

J. B. Lippincott Company's Medical and Surgical Works.

names will take a place among those common to every-day life. The whole numbers and rounded forms of the metric quantities must finally secure their exclusive adoption.

The titles of the articles are printed in bolder type, but otherwise the general style of the book has been preserved in the present volume. When a remedy is official in both the United States and British Pharmacopœias under one name, the letters "U.S., Br." follow the Latin title; but when drugs or preparations substantially the same are official under different names, the Br. is put in parentheses—thus, "U.S. (Br.)"—following the Latin title, whilst the British name is given in black letters first among the synonymes.

A new index, termed Index of Diseases, immediately precedes the main text at the beginning of the book. It has been so placed in order to prevent, in a hurried consultation, possible confusion with the general index. Both indices were made by Dr. John Bacon. The article on cinchona was written by Prof. H. H. Ru-ly, based upon elaborate original studies made by him in South America and in the London trade centres.

TESTIMONIALS.

"This 17th revised edition of the familiar, standard U. S. Dispensatory more than maintains its reputation; it is a new work, almost entirely rewritten, and made complete by including the wealth of new material of the past few years, it also makes good a former disadvantage by including an Index of Diseases; and it continues a former special feature in publishing complete the National Formulary. Thus fully equipped it will remain the pharmacist's reliable standby for another decade. . . . On every page of the volume we find evidence that the matter has been carefully rewritten, eliminating the old where antiquated and useless, and including the new by evident preference. Thus rejuvenated the U. S. Dispensatory will hold its old friends easily and attract the younger generation by force of its prestige and superiority. . . . It is a work of largest scope, of greatest magnitude, and of unquestioned authority and consequent value. It is a work of which the allied professions of medicine and pharmacy in America should be proud."—*Notes on New Remedies, N. Y.*

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"The placing of the ordinary equivalents along-side of the metric will prove a great blessing to many pharmacists who have grown old in their work and find it difficult to convert one system into the other. The young, too, who are just learning, have here a ready reference and aid in mastering the relationship between them. All the new remedies find a place in this volume, and it contains so much that is new that the authors have given us practically a new book. Such of our readers as require a Dispensatory we advise them by all means to get this, the best and most useful one published."—*New York Popular Science News.*

"Where there is so much to commend, it is difficult to find aught to criticize, and we congratulate the compilers of the work and its publishers upon the notable contribution to the working library of pharmacy which they offer to the profession."—*Detroit Pharmaceutical Era.*

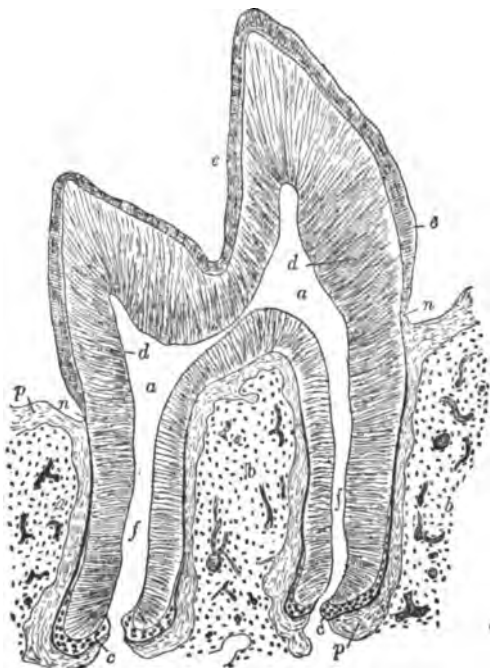
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TESTIMONIALS.

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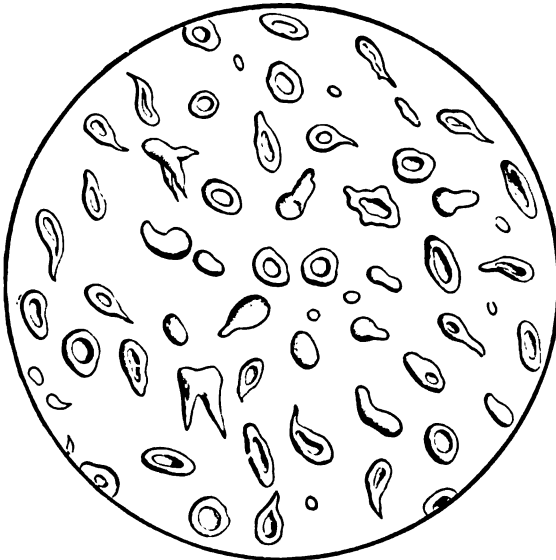
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Blood in pernicious anemia.

[Illustration from chapter on "Diseases of the Blood."]

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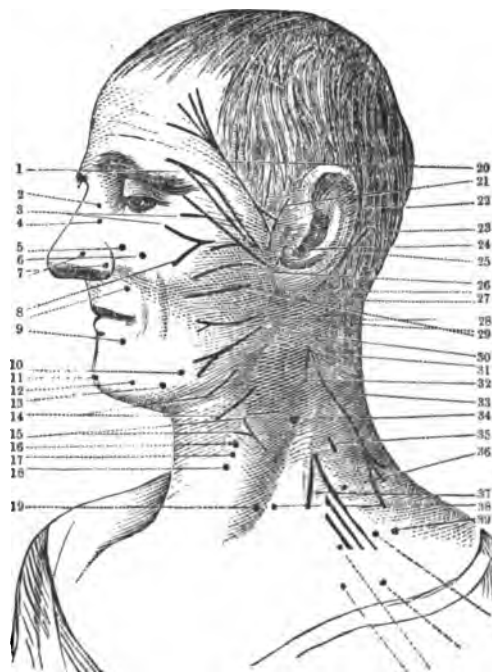
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PRESS COMMENTS.

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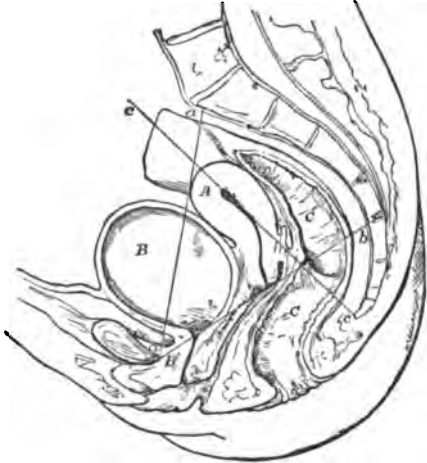
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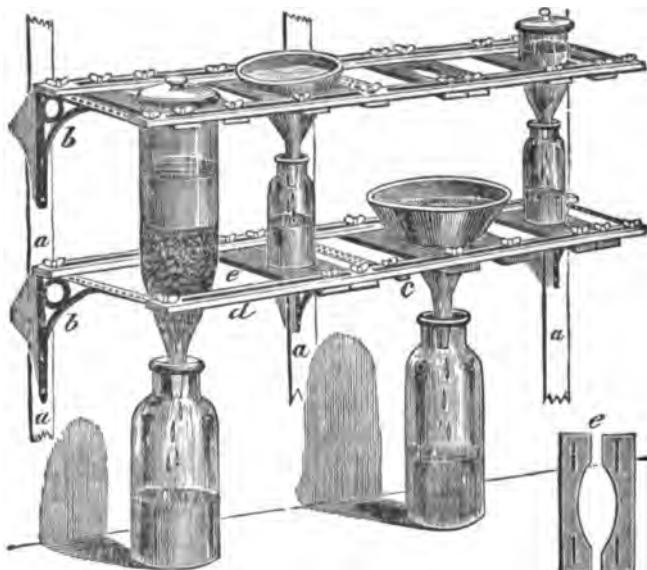
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Remington's Percolating Stand.

of the Metric system of weights and measures, having caused a revolution in pharmaceutical practice. The addition of many new remedies and the alterations in chemical and botanical nomenclature in the Pharmacopœia have added greatly to the labor of preparing the manuscript of the present work; and, since it aims to present those facts which shall be of the greatest usefulness to the pharmacist and student in such a manner as to command attention, without being so brief as to fail in its mission, an increase in the size of the book was inevitable. The features in the former edition which seemed to give

greatest satisfaction to its readers have been retained; and among the new ones may be mentioned the "Glossary" at the end of the formulary, containing short definitions of uncommon terms which the pharmacist is liable to be suddenly called upon to interpret. The working formulas are printed in bold type and constructed with especial regard to the avoidance of errors in their use, the proportions of the various ingredients being arranged to suit the needs of every-day workers who use the "Practice of Pharmacy" as a hand-book. The index, which has been amplified, has been prepared by Alfred B. Taylor, A.M., a comprehensive table of metric and old-form equivalents has been added, and the feature of indicating working formulas by heavy-faced type has been retained.

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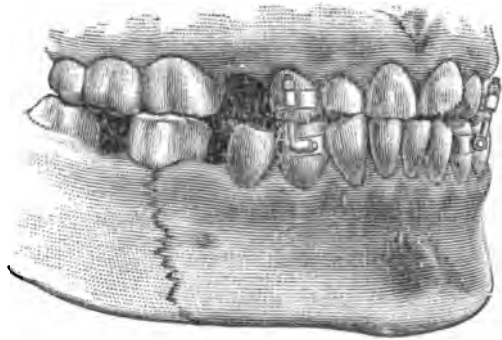
Oral surgery twenty years back was without so much as a name. To-day, oral surgery, as a specialty in medicine, is not surpassed. As expounded in the present work, oral surgery includes dentistry; it includes it in a purely surgical sense, thus assuming dentistry to be, not a profession in itself, but a part of medicine at large, such assumption being founded on an experience which clearly enough exhibits that where medical knowledge is lacking dentistry is of very little use to a community.

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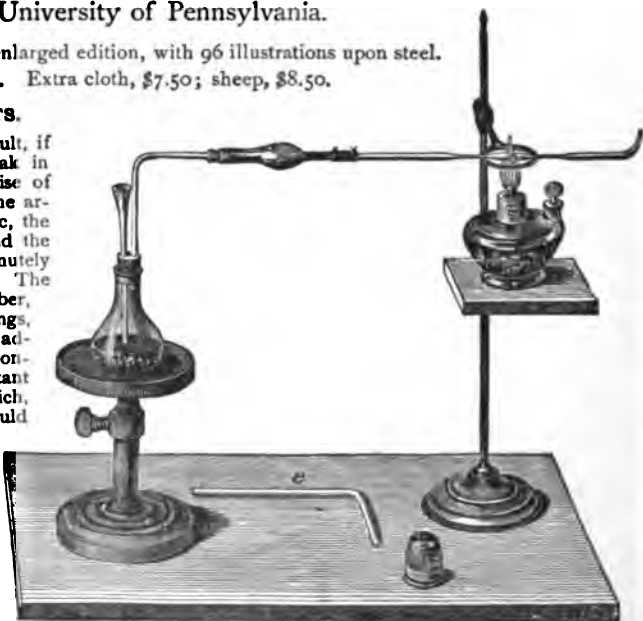
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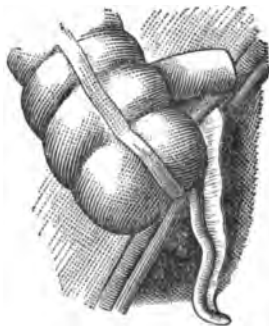
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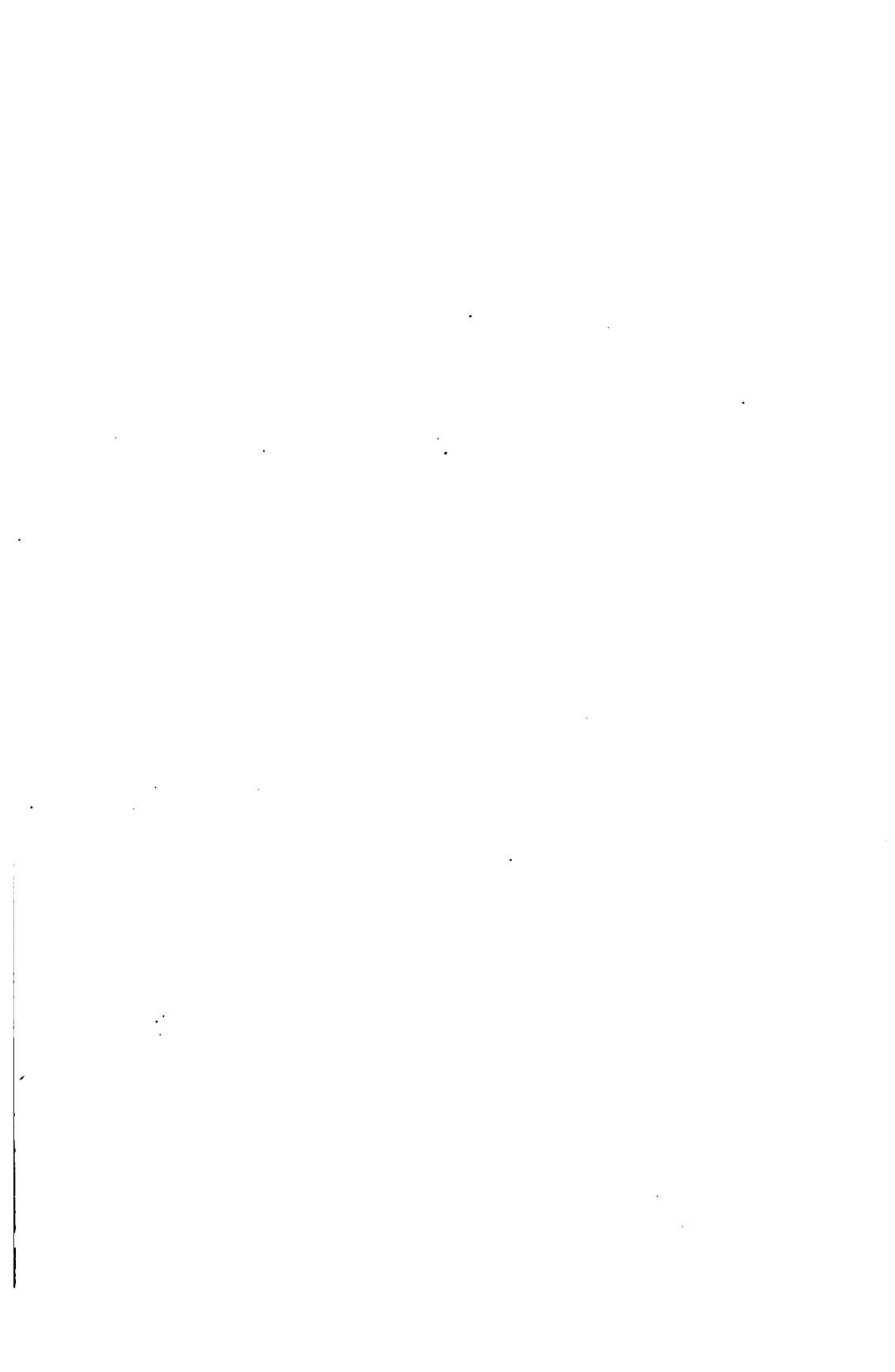
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